Installation & Maintenance Data	IM 934
	Group: **PTAC**
	Part Number: **668966801**
	Date: **December 2008**

Applied Packaged Terminal Air Conditioner and Heat Pump

Model PDAA & PDHA Dual Motor Angled Top Unit - 16" x 42"

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McQuay® Air Conditioning

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Now that you have made an investment in modern, efficient McQuay® equipment, its care and operation should be a high priority. For training information on all McQuay HVAC products, please visit us at www.mcquay.com and click on Training or phone 540-248-0711 and ask for the Training Department.

Safety Information

Follow all safety codes. Wear safety glasses and work gloves. **Use a quenching cloth for brazing operations.** Have a fire extinguisher available. Follow all warnings and cautions in these instructions and attached to the unit. Consult applicable local building codes and National Electrical Codes (NEC) for special requirements.

Recognize safety information. When you see a safety symbol on the unit or in these instructions, be alert to the potential for personal injury. Understand the meanings of the words DANGER, WARNING, and CAUTION. DANGER identifies the most serious hazards that will result in death or severe personal injury; WARNING means the hazards can result in death or severe personal injury; CAUTION identifies unsafe practices that can result in personal injury or product and property damage.

Improper installation, adjustment, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may result in personal injury or property damage. This product must be installed only by personnel with the training, experience, skills, and applicable licensing that makes him/her "a qualified professional HVACR installer."

⚠ WARNING

The installer must determine and follow all applicable codes and regulations. This equipment presents hazards of electricity, rotating parts, sharp edges, heat and weight. Failure to read and follow these instructions can result in property damage, severe personal injury or death. This equipment must be installed by experienced, trained personnel only.

⚠ DANGER

Hazardous Voltage!
Disconnect all electric power including remote disconnects before servicing. Failure to disconnect power before servicing can cause severe personal injury or death.

⚠ CAUTION

Use copper conductors only. Unit terminals are not designed to accept other types of conductors. Failure to do so can damage equipment.

Inspection

When the equipment is received all items should be carefully checked against the bill of lading to be sure all crates and cartons have been received. All units should be carefully inspected for damage when received. If any damage is noticed, the carrier should make the proper notation on the delivery receipt acknowledging the damage. The carrier should also fill out a carrier Inspection Report. The McQuay Inc. Traffic Department should then be contacted. The unit nameplate should be checked to make sure the voltage agrees with the power supply available.

A complete unit consists of the following components, ordered and shipped separately.

1. Heating/Cooling Chassis and Cabinet or Front Panel.
2. Wall Sleeve.
3. Outdoor Louver.
4. Subbase – Optional for 208V and 230V units but mandatory for all 265V.
5. Fixed heater with factory installed power cord.
6. Electrical receptacle – Required for 208V and 230V units, mandatory for all 265V and Hydronic units.
7. Plug cord cover – Optional for 208V and 230V units but mandatory for all 265V.

IMPORTANT

This product was carefully packed and thoroughly inspected before leaving the factory. Responsibility for its safe delivery was assumed by the carrier upon acceptance of the shipment. Claims for loss or damage sustained in transit must therefore be made upon the carrier as follows:

VISIBLE LOSS OR DAMAGE

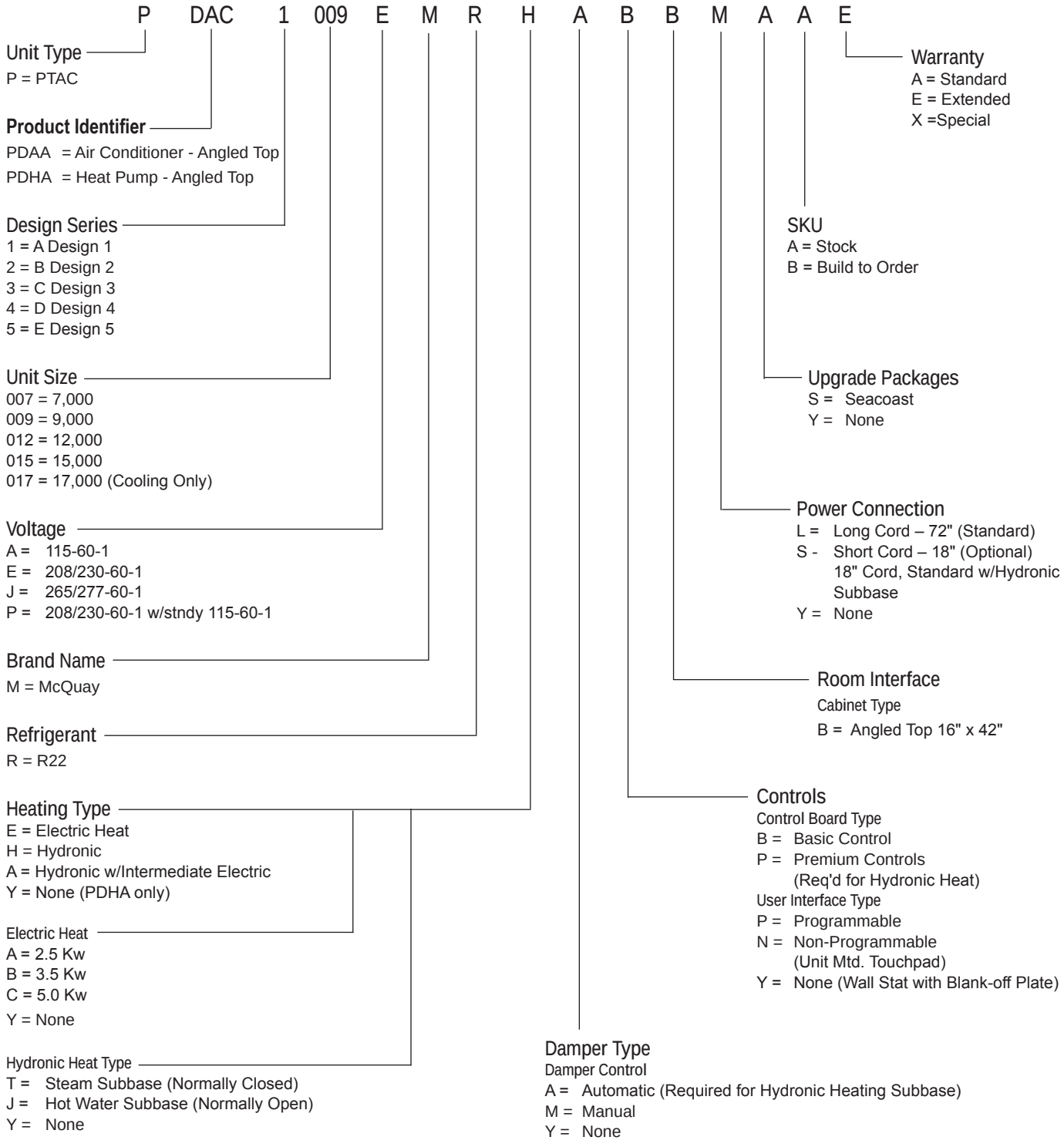
Any external evidence of loss or damage must be noted on the freight bill or carrier's receipt, and signed by the carrier's agent. Failure to adequately describe such external evidence of loss or damage may result in the carrier's refusal to honor a damage claim. The form required to file such a claim will be supplied by the carrier.

CONCEALED LOSS OR DAMAGE

Concealed loss or damage means loss or damage which does not become apparent until the product has been unpacked. The contents may be damaged in transit due to rough handling even though the carton may not show external damages. When the damage is discovered upon unpacking, make a written request for inspection by the carrier's agent within fifteen (15) days of the delivery date. File a claim with the carrier since such damage is the carrier's responsibility.

McQuay Model PDAA/PDHA Product Nomenclature

Note: *For Illustration purposes only. Not all options available with all models.*
Please consult a McQuay Sales Representative for specific availability.



Introduction

McQuay offers the most complete line of PTAC and PTHP products for new construction projects and exact replacements for our original Singer, Remington, American Air Filter and American Standard brand equipment, and models from other manufacturers.

McQuay products feature our proven institutional grade design and construction that allows you to benefit from the long life, reliability, and low sound levels, along with higher energy efficiencies for lower operating costs. Plus, McQuay offers a nationwide network for original equipment replacements with local parts and service.

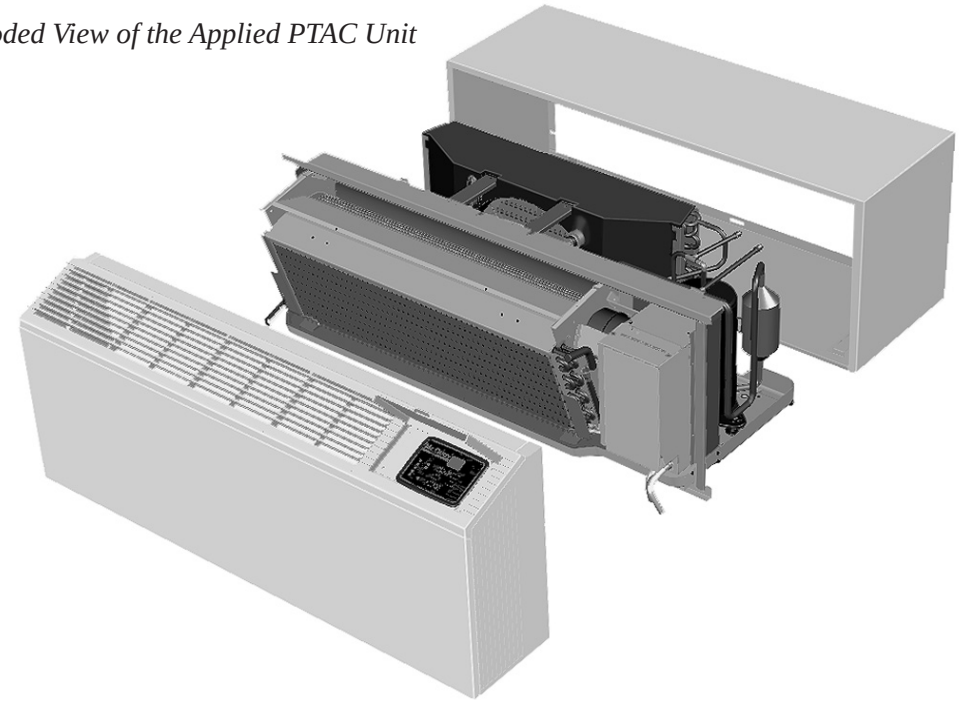
McQuay® Applied Packaged Terminal Air Conditioners and Heat Pumps are designed and built for through-the-wall installation in either new or existing buildings. The self-contained refrigerant system delivers cooling to the desired space. Heating can be accomplished with electric resistance, with hydronic (water or steam), hydronic with intermediate electric resistance or with reverse cycle technology (heat pump models only). Generally, an estimate for capacity selection is 35 BTUH per square foot of floor space (cooling) and 4 BTUH (1.25 watts) per cubic foot (heating). The architect or engineer must verify the selection. Note that the heat pump reverse cycle generates approximately 10 BTUs per electrical watt as compared to 3.4 BTUs per watt with resistance electric heat. The unit will restart at its last setting after a power interruption.

Figure 1. Model PDAA/PDHA Unit with Non-programmable Touchpad Control (Shown with Subbase)

Notes:

1. *Unit pictured with subbase installed. Subbase is optional on 208V 230V units Subbase is required on all 265V and units with hydronic heat. See pages 8 & 9 for subbase dimensions. Sides are adjustable.*
2. *Opening needs to be 16 5/8" (422mm) x 42 5/8" (1083mm) when using a louver frame. See page 13, Figure 13.*

Figure 2. Exploded View of the Applied PTAC Unit



Dimensional Data

Figure 3. Chassis Dimensions

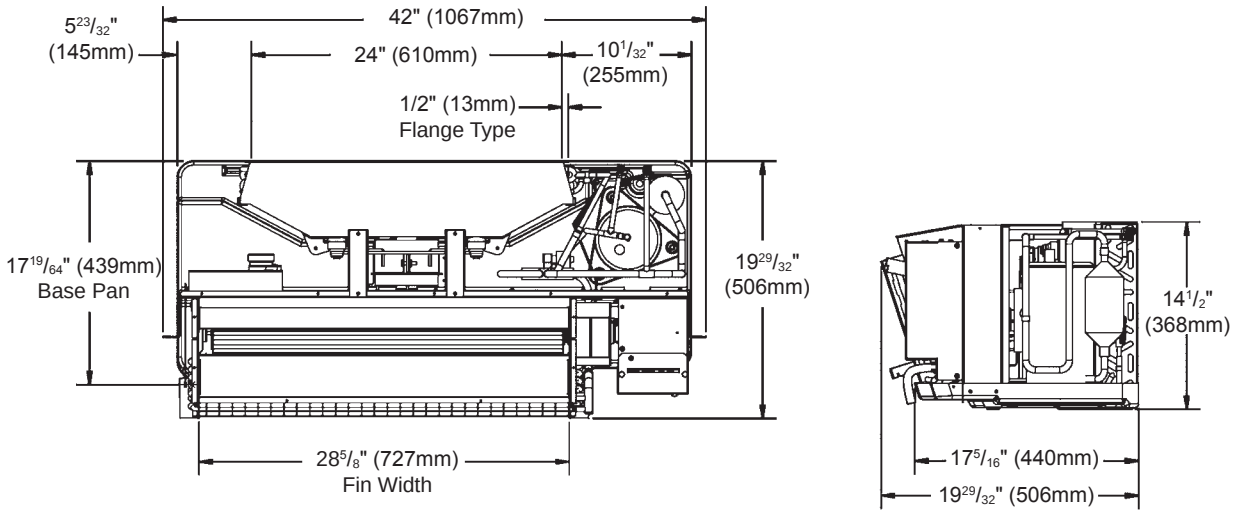
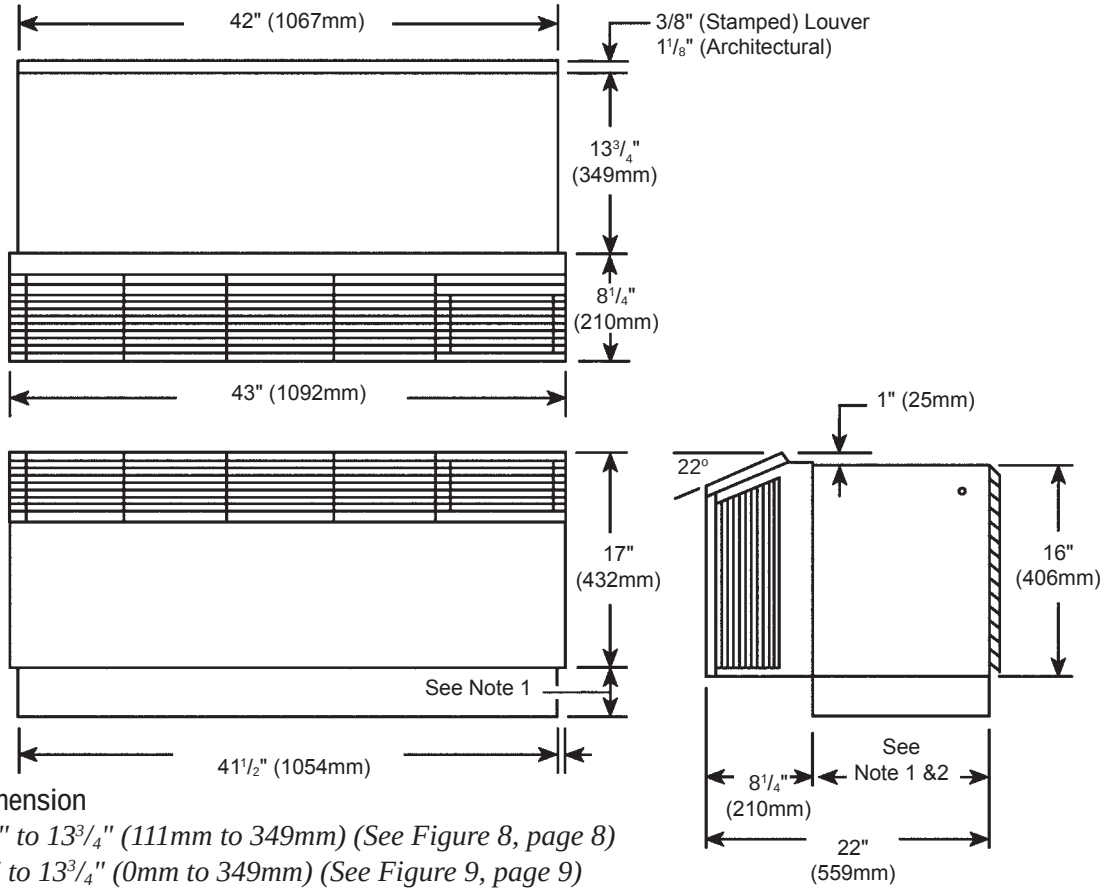


Figure 4. Front Panel with Wall Sleeve and Subbase Dimensions



Subbase Side Dimension

Electric: 4 3/4" to 13 3/4" (111mm to 349mm) (See Figure 8, page 8)
Hydronic: 0" to 13 3/4" (0mm to 349mm) (See Figure 9, page 9)

Subbase Height Dimension

Electric: 3" to 4" (76mm to 102mm) with 0" to 1" (0mm to 25m) leveling screw
Hydronic: 8" (203mm) with 1/4" (6mm) to 1 1/4" (32mm) leveling bolts

Notes:

1. *Unit pictured with subbase installed. Subbase is optional on 208V and 230V units. Subbase is required on all 265V units and units with hydronic heat. Subbase extends to front edge of unit when furnished with hydronic heat. Hydronic subbase is flush with the front of the cabinet. Electric subbase is flush with wall sleeve.*
2. *Subbase side channels are adjustable from 4 3/8" to 13 3/4" (111mm to 349mm).*

Wall Opening Requirements

When roughing in the opening for the wall sleeve, make certain there is sufficient clearance from the walls and floor. The wall sleeve should be positioned a minimum of 5/8" in from the room side finished wall to accommodate the room cabinet. A minimum distance of 3" above the finished floor is required for return air.

The rough opening should measure $16^1/_4$" high x $42^1/_4$" wide. When using a louver frame, the opening must measure $16^5/_8$" x $42^5/_8$". Louver frames should be used for panel wall and thin wall applications to assure positive anchoring to the wall (Figure 13). When a elecrical subbase is used, the opening must start 3" to 4" above the finished floor (including carpeting) to match the height of the subbase selected. The subbase is available in 3" or 4" heights and has adjustable leveling legs that provide up to an additional 1" height.

A 3" or 4" subbase is required for 265V models and is optional for 208/230V models.

Wall Construction Types

Figure 5. Panel Wall (Thin) Construction

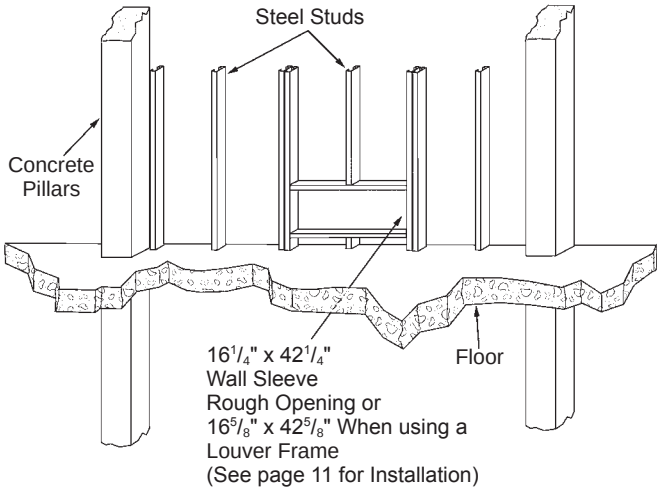

Steel Studs
Concrete Pillars
16 1/4" x 42 1/4" Wall Sleeve Rough Opening or 16 5/8" x 42 5/8" When using a Louver Frame (See page 11 for Installation)
Floor

Figure 6. Masonry Wall (Thick) Construction

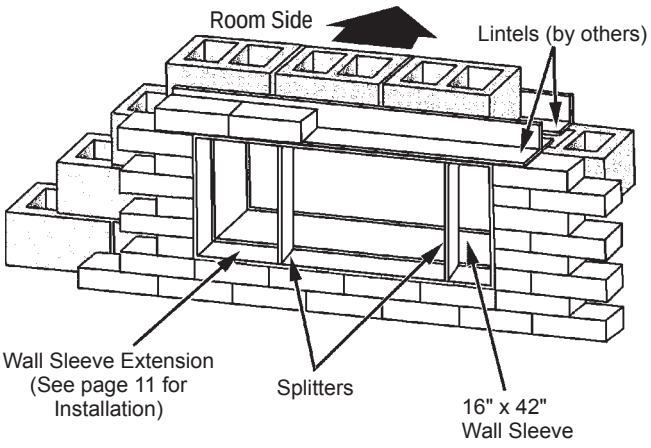
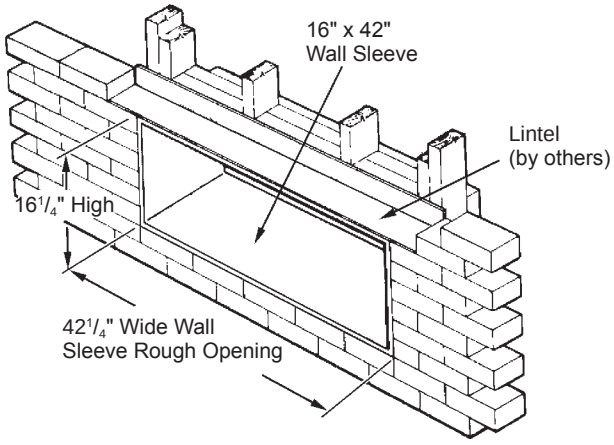


Figure 7. Frame and Brick Construction



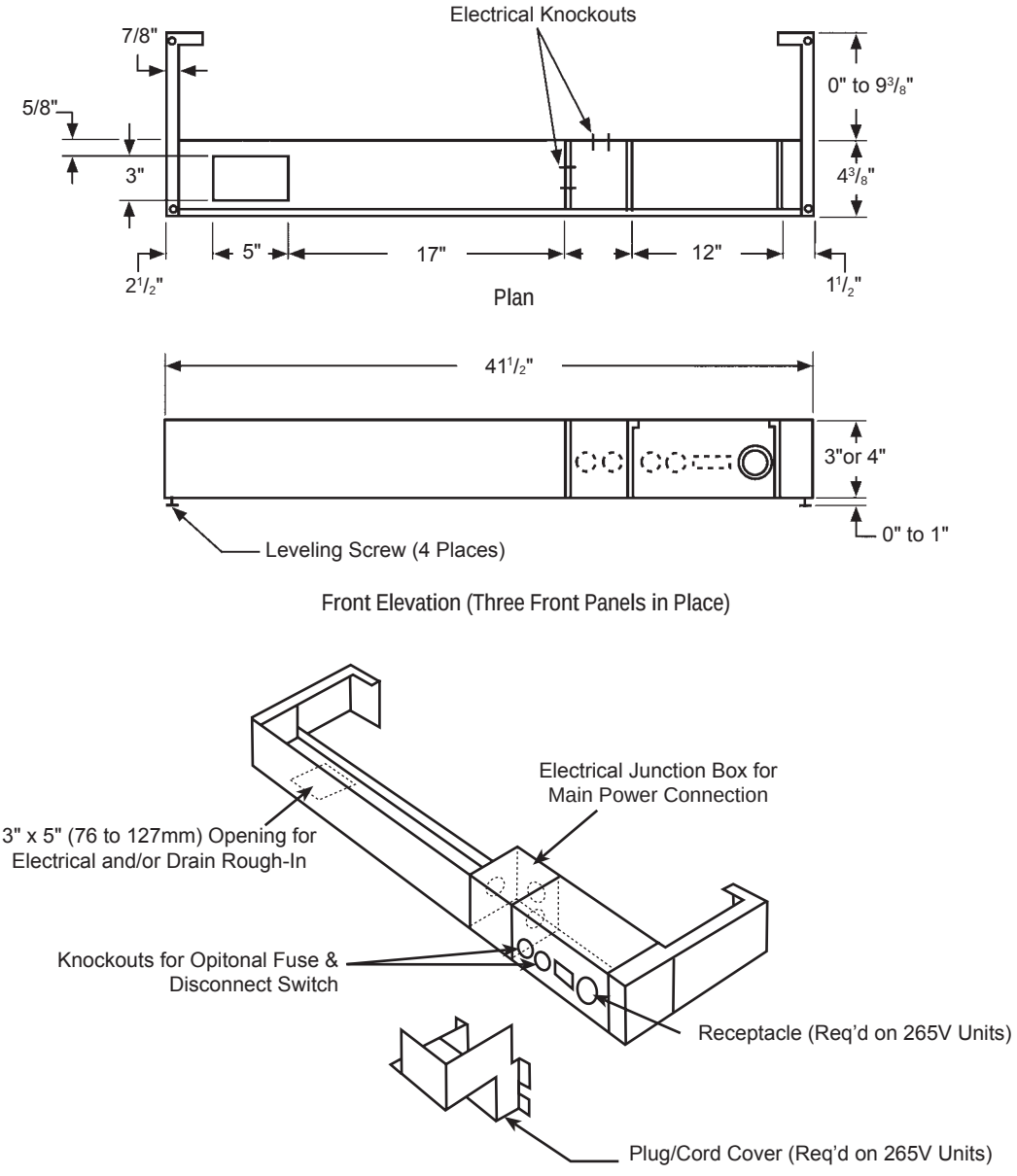
Installation of Subbase

Electric Subbase

An electrical subbase is optional for all 208V and 230V units. A subbase is required for all 265V units. The subbase is available in 3" (76mm) or 4" (102mm) heights. The subbase contains leveling legs for adjustment of up to 1" (25mm) additional height. All subbases are factory supplied, field installed options.

1. If the minimum depth subbase is required, discard the side extension pieces.
2. If more than the minimum depth is required, determine the depth of the side extension pieces desired and break at proper score - line. Insert the extension pieces into the front assembly and secure with two short black screws at each side.
3. Insert leveling bolts into subbase bottom flange. Four (4) bolts will be needed if side extensions are used. Only two (2) bolts are required if side extensions are not used.
4. Place the subbase on the floor and align its center line with the center line of the wall opening. Do not fasten the subbase to the floor. Attach the subbase to the wall sleeve using the clips provided with the subbase.
5. The wiring should be roughed in and the conduit connected to the subbase junction box. Complete the installation by wiring the receptacle to the incoming power supply.

Figure 8. Electric Subbase



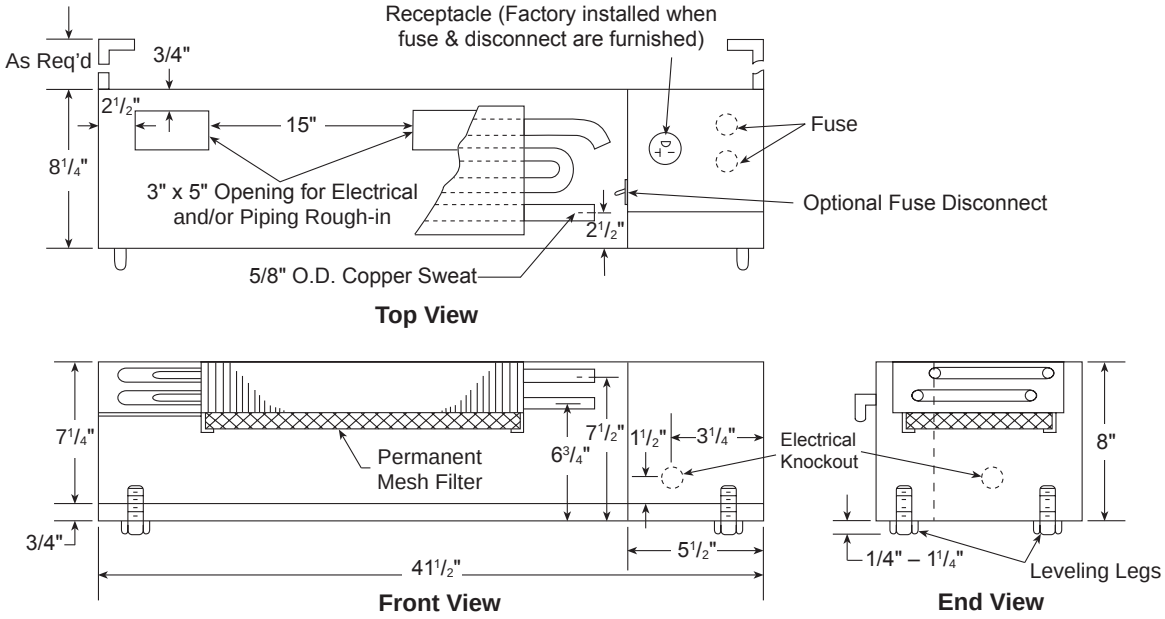
Installation of Subbase

Hydronic Subbase

A subbase is available as required with all hydronic units. This subbase measures 8" (203mm) in height and includes the hydronic heating coil. Refer to IM Bulletin 936 for installation details. In addition, rough in supply and return piping.

Electrical and plumbing rough-in can be done through the back of the hydronic heat section or through the openings provided in the bottom of the subbase. The finished piping can be done now or later.

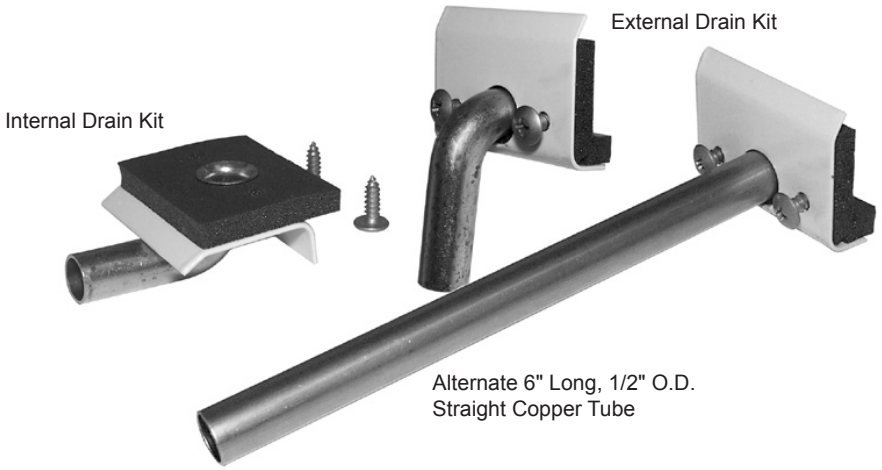
Figure 9. Hydronic Subbase



NOTES:

1. *Side channels are adjustable from 0"–9 3/8" in length by inverting them. Side channels are predrilled to allow infinite adjustment.*
2. *Subbase shown with louvered front panel removed. Front panel is hinged to allow access to valve, coil, filter & electrical junction box.*
3. *Leveling legs are adjustable from 1/4"–1 1/4".*

Optional Condensate Drain Kits



Installation of Optional Condensate Drain Kit

Figure 10 illustrates the installation of the indoor drain kit. The indoor drain kit must be installed before placing the wall sleeve into the opening. Install as follows:

1. Locate the drain so that it will be on the room side of the wall when the wall sleeve is installed.
2. Drill a 1/2" diameter hole in the base of the wall sleeve for the drain.
3. Drill two (2) 5/32" pilot holes for the mounting screws. These holes can be located using the drain kit as a pattern.
4. Assemble the drain kit as shown in Figure 10 and securely fasten it to the wall sleeve with the screws provided. Use either the 90° elbow or 6" straight fitting as required.
5. Install the wall sleeve as described on pages 11-16.

Assembly of the outdoor drain kit should be completed after the wall sleeve has been installed.

Note: *When using the outdoor drain kit, the sleeve must be flush or beyond the outside finished wall (do not recess).*

Install the external drain kit as follows:

1. Assemble the drain kit as shown in Figure 11.
2. Choose the side of the wall sleeve to which the drain kit is to be installed.
3. There are drain holes and pilot holes provided in the wall sleeve from factory. Place the drain kit against the chosen drain hole and fasten securely with screws provided. Use either the 90° elbow or 6" straight fitting as required.
4. Cover the unused drain hole with the block off plate and gasket supplied with the drain kit.

Figure 10. Indoor Drain Kit

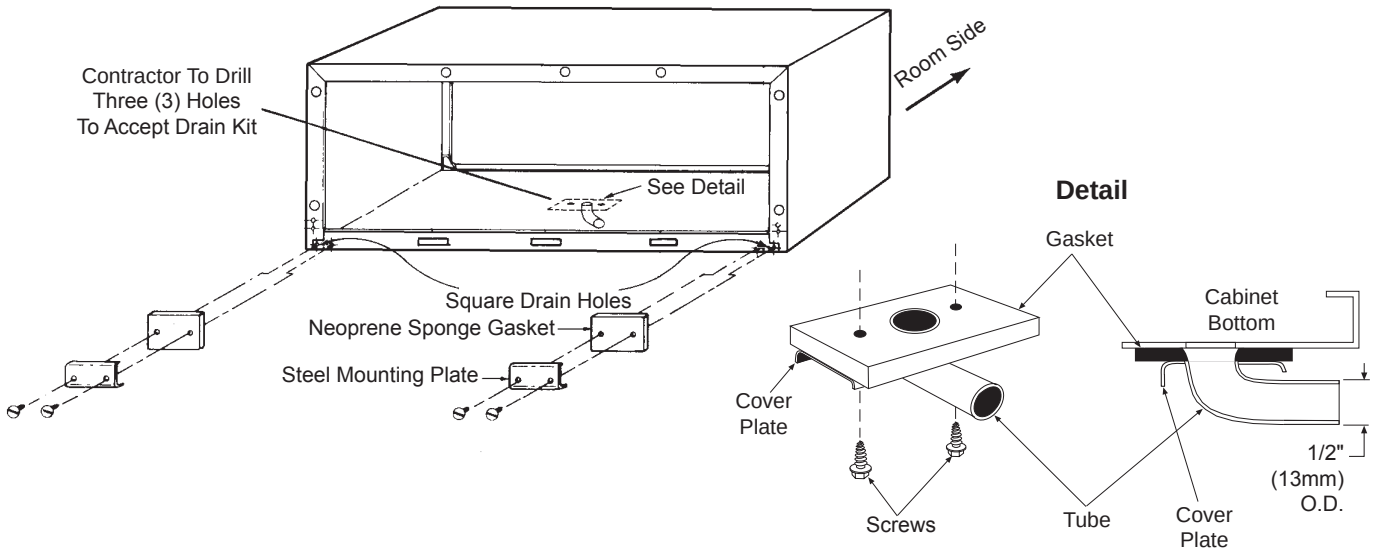
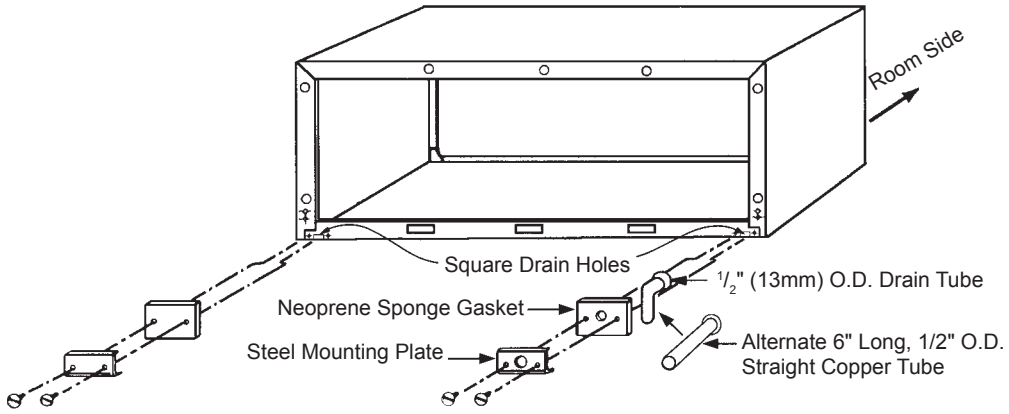


Figure 11. External Drain Kit



Note: *Use of 6" straight drain tube will require modification of architectural louver.*

Installation of Wall Sleeve

Considerations

The wall sleeve is a standard size 16" high, 42" wide and 13 3/4" deep. Slide channels are factory welded into the sleeve to facilitate easy installation and removal of the chassis. Each wall sleeve is predrilled to match the mounting screws of the chassis. Knockouts are provided for the optional external drain kit used with the heat pump models.

All necessary fasteners are supplied to assemble the chassis and the louver to the wall sleeve.

Wall Sleeve Extension for Thick Wall Construction Types

The standard wall sleeve will accommodate a maximum wall thickness described in table 1. For thicker walls, wall sleeve extensions are required and are available from your local representative. When it is supplied by the representative, it is treated for maximum corrosion resistance and matched to exact size of the standard wall/sleeve. Be sure to provide air splitters to prevent recirculation of condenser air. Air splitters should be placed in the wall sleeve as shown in figure 12. It is important that spacing of the air splitters match exactly those dimensions shown in figure 12.

Table 1. Maximum Wall Thickness

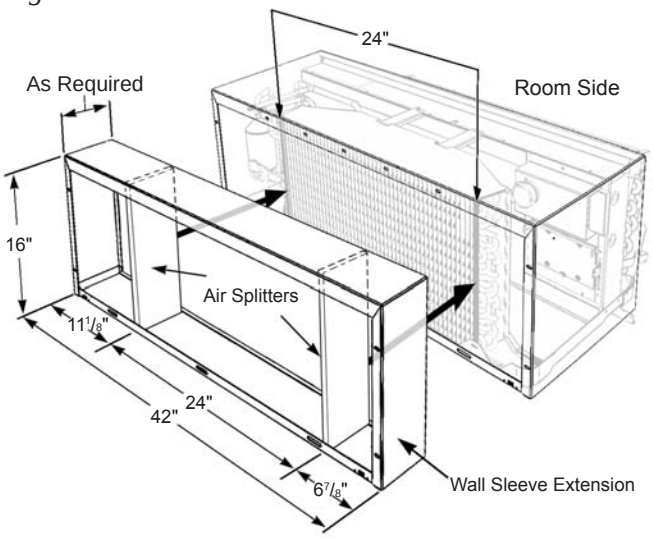
Louver Type	Maximum Wall Thickness		
	No Subbase	Standard Subbase	Hydronic Subbase
Stamped	14"(356mm)	9 1/2"(241mm)	13 1/8"(333mm)
Architectural	14 7/8"(378mm)	10 3/8"(264mm)	14"(356mm)

Installation of Wall Sleeve Extension

Wall sleeve extensions are shipped in a separate carton and tagged to match the proper unit. Be sure to check tagging of the extension against that of the unit. Install the wall sleeve extension as follows:

1. Position the extension with standard wall sleeve so proper alignment with drain and mounting holes is achieved.
2. Place a bead of caulk around the perimeter of the wall sleeve and another bead around the mating side of the wall sleeve extension so that the joint is watertight. Be sure to use a resilient caulking such as silicone.
3. Assemble the wall sleeve extension to the wall sleeve. Clean out weep holes to assure proper drainage.

Figure 12. Wall Sleeve Extension



4. Attach indoor drain kit (if used) according to the instructions on page 10. Outdoor drain kits must be installed after wall sleeve is in place.
5. Continue wall sleeve installation according to instruction #4 on page 12.

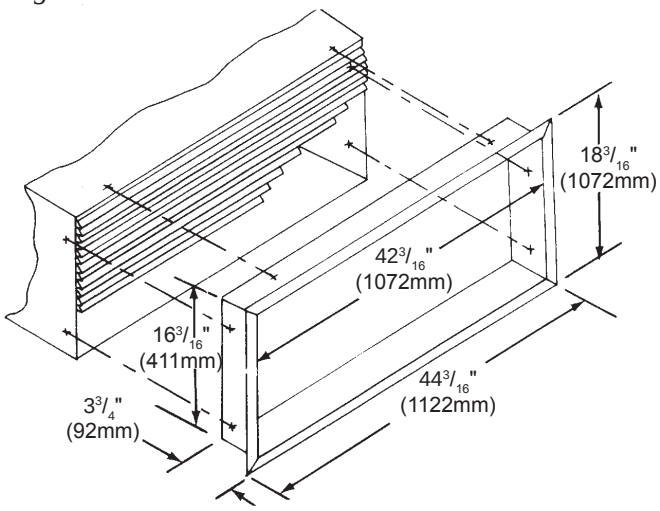
Installation of Louver Frame for Thin Wall Construction Types

Louver frames should be used for panel wall and thin wall applications to assure positive anchoring to the wall. Recess the wall sleeve so that the louver is flush with the outside of the building. Place louver frame around wall sleeve as shown in figure 13. Secure angles at side and top of walls.

⚠ CAUTION

DO NOT drill holes in the bottom of the wall sleeve as it will cause leaks.

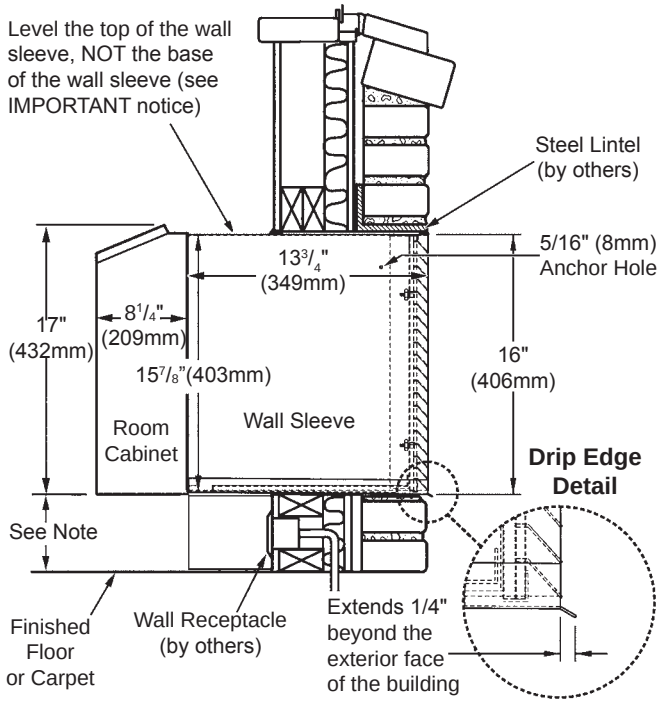
Figure 13. Louver Frame Dimensions



Note: *Wall Sleeve rough opening when using a Louver Frame must be 16 5/8" x 42 5/8"*

Installation of Recessed Louver Wall Sleeve

Figure 14. Recessed Louver Wall Sleeve Detail


Level the top of the wall sleeve, NOT the base of the wall sleeve (see IMPORTANT notice)
Steel Lintel (by others)
5/16" (8mm) Anchor Hole
13 3/4" (349mm)
8 1/4" (209mm)
17" (432mm)
15 7/8" (403mm)
16" (406mm)
Room Cabinet
Wall Sleeve
Drip Edge Detail
See Note
Finished Floor or Carpet
Wall Receptacle (by others)
Extends 1/4" beyond the exterior face of the building

Note: *Standard subbase is available in 3" or 4" (76 mm or 102 mm) height. Leveling legs provide adjustment of 1" (25 mm).*

Installation Requirements for Recessed Louver Wall Sleeve

1. The Recessed Louver Wall Sleeve must extend a minimum of $1^{1}/_{4}$" past the finished interior wall.
2. The Recessed Louver Wall Sleeve must be installed so that it is flush with the exterior face of the building and the drip edge must extend 1/4" beyond the face (Figure 14).

Installation of Recessed Louver Wall Sleeve

1. Clean the opening of all debris that may interfere with installation.
2. If the unit is to be supplied with a subbase, install subbase before installing wall sleeve (see IM 936).
3. lf the optional drain kit is to be employed (heat pump only), see IM 942.

NOTICE

Heat pump models will generate condensate during the heating season. If it is not desirable for this condensate to exit outdoors from the wall sleeve drain holes, install indoor or outdoor drain kits, available from your sales representative (see page 9 & 10).

4. Place a thin pad of soft mortar on the bottom of the opening and slide in the wall sleeve. Louver should be flush to exterior surface when complete.

Note: *The wall sleeve is not intended to replace the lintel.*

IMPORTANT!

Do Not level base of wall sleeve. The bottom of the Recessed Louver Wall Sleeve has a built in pitch to the outside for proper drainage. (The inside height dimension is 15.88" and the outside dimension is 16" to provide the necessary drainage pitch). Level the wall sleeve using the top or the inside top surface of the wall sleeve

NOTICE

A Flush Stamped Louver can not be used with a recessed louver wall sleeve. Louver is special order. Contact factory for more information if necessary.

5. Level the wall sleeve in both directions, left to right and inside to outside, using the **top** of the wall sleeve and plumb wall sleeve for vertical on the sides.
6. Secure by anchoring with appropriate fastener(s). A 5/16" (8mm) hole is provided on each side, 2" (51 mm) down from the top and 2" (51mm) in from the rear of the wall sleeve. Additional holes may be required to firmly secure the wall sleeve (Figure 15).

⚠ CAUTION

DO NOT drill holes in the bottom of the wall sleeve as it will cause leaks.

Anchoring The Wall Sleeve

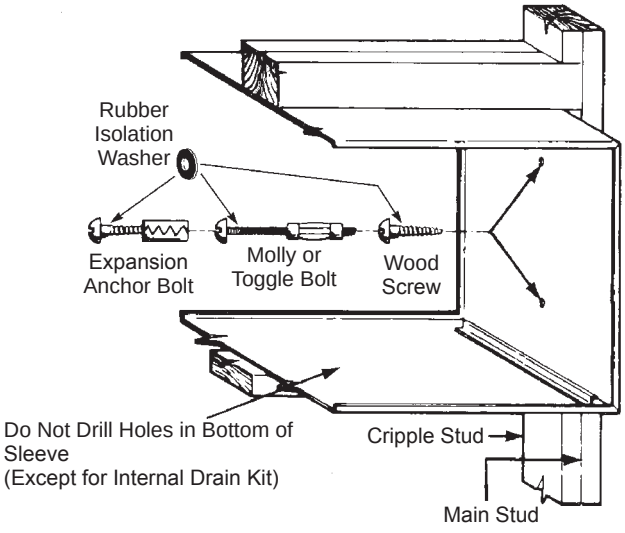
Anchoring the wall sleeve in the opening is accomplished as shown in figure 15.

⚠ CAUTION

DO NOT drill holes in the bottom of the wall sleeve as it will cause leaks.

It is recommended that rubber isolation washers be used with the fasteners to minimize sound transmission from the equipment to the wall at the point of contact.

Figure 15. Anchoring the Wall Sleeve (all anchoring hardware field supplied)


Rubber Isolation Washer
Expansion Anchor Bolt
Molly or Toggle Bolt
Wood Screw
Do Not Drill Holes in Bottom of Sleeve (Except for Internal Drain Kit)
Cripple Stud
Main Stud

Attaching Cabinet Wall Sleeve to Subbase

1. Where a subbase is used, secure wall sleeve to subbase with clips provided.
2. Caulk the wall sleeve to the wall opening on both the inside and outside perimeter. Be careful not to plug the weep holes. Caulking should be resilient, nonhardening type such as silicone.
3. Secure the two sections by installing the clip screws supplied with the hardware bag.
4. Caulk indoor/outdoor perimeter of wall sleeve with resilient caulk such as silicone.
5. Finish any uncompleted electrical and/or plumbing connections.

Installation of Basic Wall Sleeve

Frame and Brick Wall Construction Type

A heavy-gauge, corrosion resistant wall sleeve is provided for each unit. The wall sleeve is either shipped in a separate carton or shipped in a multipack of 15.

The basic wall sleeve is designed to be easily installed in a variety of wall constructions. **Note:** The center of gravity is 10" (254mm) from the rear face of the wall sleeve. The wall sleeve must be inserted into the wall at least 10" (254mm) or other support must be employed. Support can be from a factory supplied subbase or from other field supplied materials. Recommended installation procedures are described below (see Figures 16, 17, & 18).

1. Clean the opening of all debris that may interfere with installation.
2. If the unit is to be supplied with a subbase, install subbase before installing wall sleeve (see IM 936).
3. lf the optional drain kit is to be employed (heat pump only), see IM 942.
4. Place a thin pad of soft mortar on the bottom of the opening and slide in the wall sleeve.
   Be sure to recess the wall sleeve enough to accommodate outside louver. This recess is 3/8" (9.5mm) for stamped louvers and $1^1/_4$" (32mm) for architectural louvers. Louver should be flush to exterior surface when complete.
   Note: *The wall sleeve is not intended to replace the lintel.*
5. Level wall sleeve left to right and pitch 1/4" front to back, pitch to the outside. Secure by anchoring with appropriate fasteners.
   A 5/16" (8mm) hole is provided on each side, 2" (51 mm) down from the top and 2" (51mm) in from the rear of the wall sleeve. Additional holes may be required to firmly secure the wall sleeve. Refer to Anchoring The Wall Sleeve instructions and figure 15.

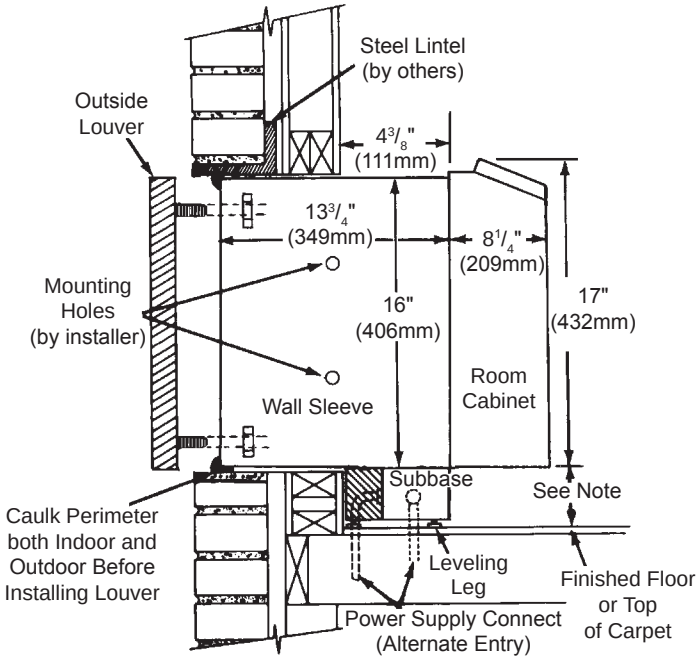
⚠ CAUTION

DO NOT drill holes in the bottom of the wall sleeve as it will cause leaks.

6. Where a subbase is used, secure wall sleeve to subbase with clips provided.
7. Caulk the wall sleeve to the wall opening on both the inside and outside perimeter. Be careful not to plug the weep holes. Caulking should be resilient, nonhardening type such as silicone.

Installation of Basic Wall Sleeve

Figure 16. Frame and brick with electrical subbase



Note: *Standard subbase is available in 3" or 4" (76 mm or 102 mm) height. Leveling legs provide adjustment of 1" (25 mm).*

Figure 17. Frame and brick with cord connection

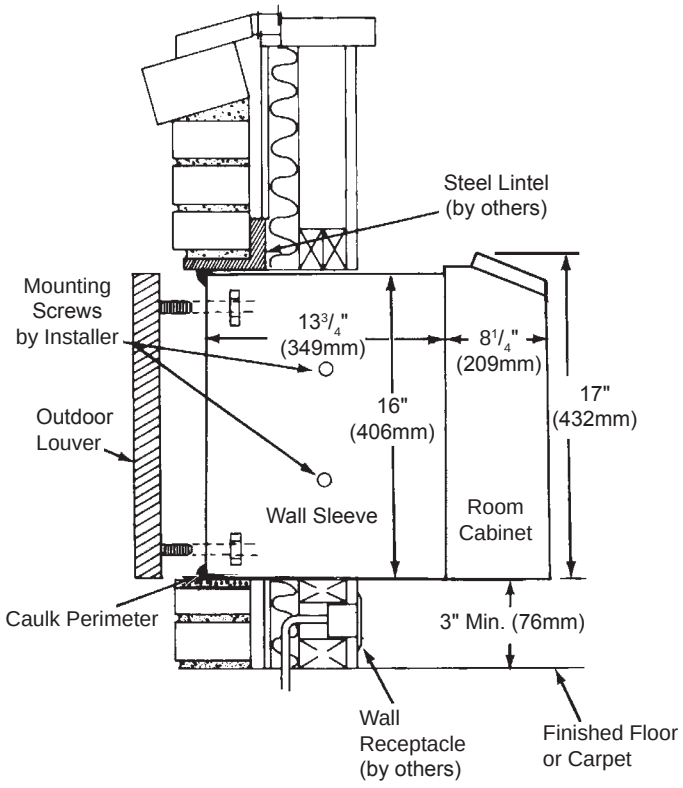
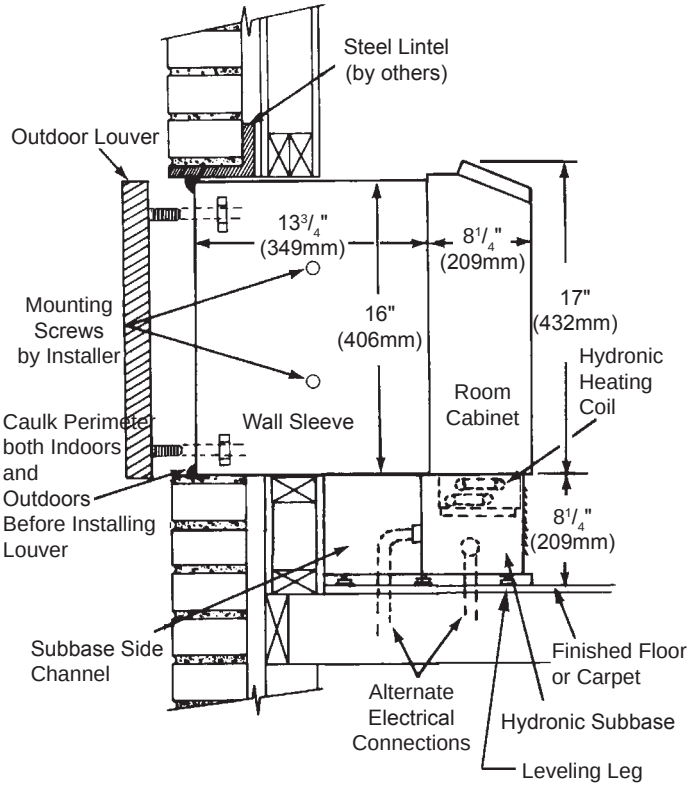


Figure 18. Frame and brick with hydronic subbase



Panel Wall Construction Type

For panel wall and thin wall construction, it is recommended that a louver frame be used (See Louver Frame Installation For Thin Wall Types on page 11, and figures 19, 20 & 21).

Panel wall and thin wall construction varies only slightly from frame and brick construction. ***Note:*** *The center of gravity is 10" (260mm) from the rear face of the wall sleeve. The wall sleeve must be inserted into the wall at least 10" (260mm) or other support must be employed.* Support can be from a factory supplied subbase or from other field supplied materials. Installation for this application is as follows (Figures 19, 20, & 21).

1. Clean the opening of all debris that may interfere with installation.
2. If the unit is to be supplied with a subbase, install subbase before installing wall sleeve (see IM 936).
3. If the optional drain kit is to be employed, see IM 942.
4. Be sure the wall sleeve is mechanically attached to the wall and caulked to assure a proper seat. It is recommended that the louver frame be used for this purpose.

Installation of Basic Wall Sleeve

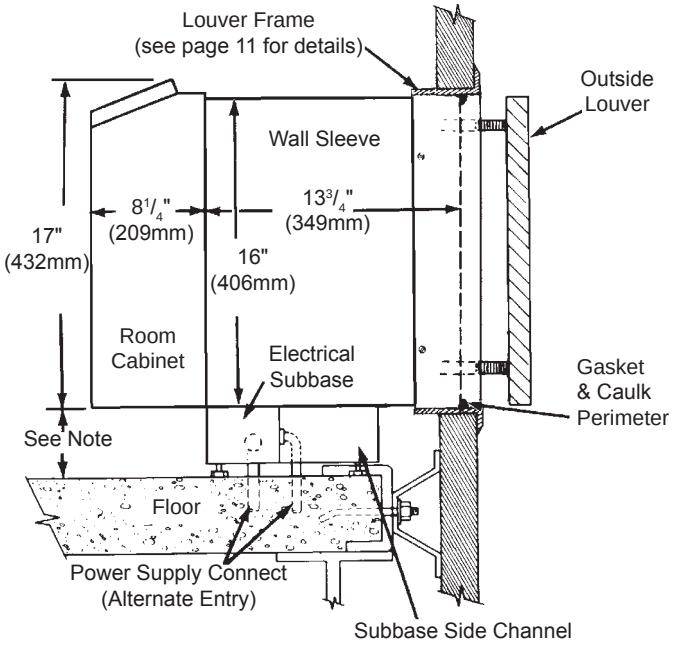
5. Recess the wall sleeve so that the louver is flush with the exterior of the building.
6. Level wall sleeve in both directions and secure by anchoring with appropriate fasteners or drill additional holes as required to secure firmly. Refer to Anchoring The Wall Sleeve instructions on page 13.

⚠ CAUTION

DO NOT drill holes in the bottom of the wall sleeve as it will cause leaks.

7. Where a subbase is used, secure wall sleeve to subbase with clips provided.
8. Caulk the wall sleeve to the wall opening on both the inside and outside perimeter. Be careful not to plug the weep holes. Caulking should be resilient, nonhardening type such as silicone.

Figure 19. Panel wall construction with standard electrical subbase



Note: *Standard subbase is available in 3" or 4" (76 mm or 102 mm) height. Leveling legs provide adjustment of 1" (25 mm).*

Attaching Wall Sleeve to Subbase

1. Where a subbase is used, secure wall sleeve to subbase with clips provided.
2. Caulk the wall sleeve to the wall opening on both the inside and outside perimeter. Be careful not to plug the weep holes. Caulking should be resilient, nonhardening type such as silicone.
3. Secure the two sections by installing the clip screws supplied with the hardware bag.
4. Caulk indoor/outdoor perimeter of wall sleeve with resilient caulk such as silicone.
5. Finish any uncompleted electrical and/or plumbing connections.

Figure 20. Panel wall construction with cord connection

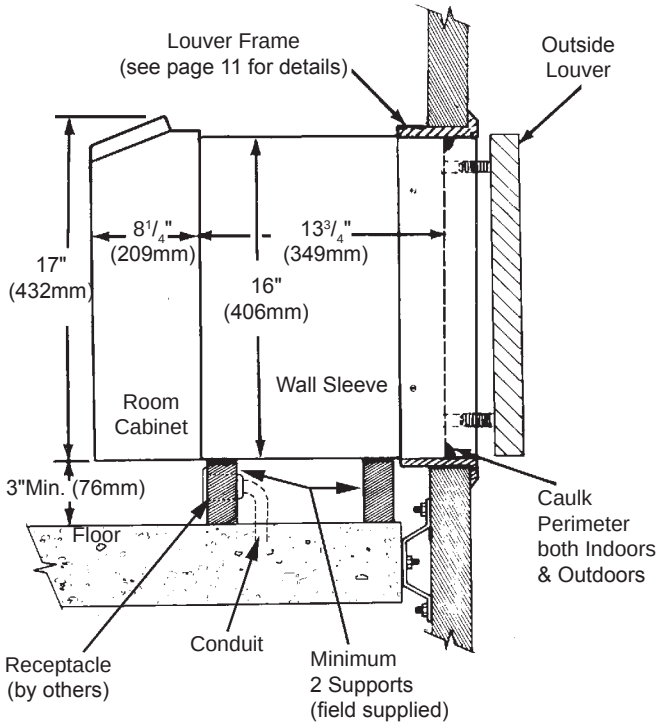
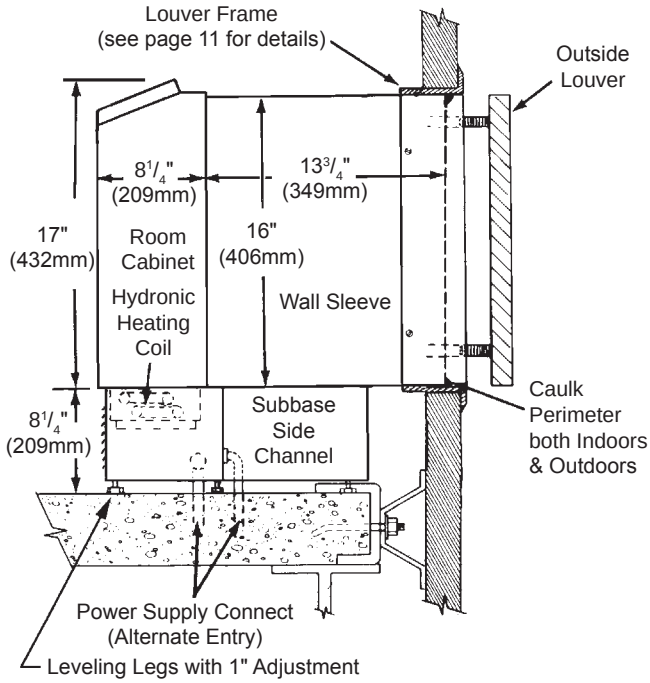


Figure 21. Panel wall installation with hydronic subbase



Installation of Basic Wall Sleeve

Thick Wall Construction Type

Installation of wall sleeves for thick walls requires special consideration. Table 2 should be used to determine the maximum wall thickness allowed for the basic wall sleeve. For thicker walls, wall sleeve extensions are available from your representative (see page 11 for details).

Wall sleeve installation in thick walls is similar to frame and brick installation. Install as follows (Figure 22, 23, & 24).

1. Clean the opening of all debris that may interfere with installation.
2. If the unit is to be supplied with a subbase, install subbase before installing wall sleeve *see IM 936*.
3. If the optional drain kit is to be employed (heat pump only) *see IM 942*.
4. If wall thickness exceeds dimensions shown in Table 2, a wall sleeve extension must be used. Once the extension is attached to the wall sleeve, place a thin pad of soft mortar on the bottom of the opening and slide in the wall sleeve/extension assembly. Be sure to recess the wall sleeve enough to accommodate outside louver. This recess is 3/8" (9.5mm) for stamped louvers and $1^1/_4$" (32mm) for architectural louvers. Louver should be flush to exterior surface when completed. ***Note:*** *The wall sleeve is not intended to replace the lintel.*
5. Level wall sleeve in both directions and secure by anchoring with appropriate fasteners or drill additional holes as required to secure firmly. Refer to Anchoring The Wall Sleeve instructions on page 13.

⚠ CAUTION

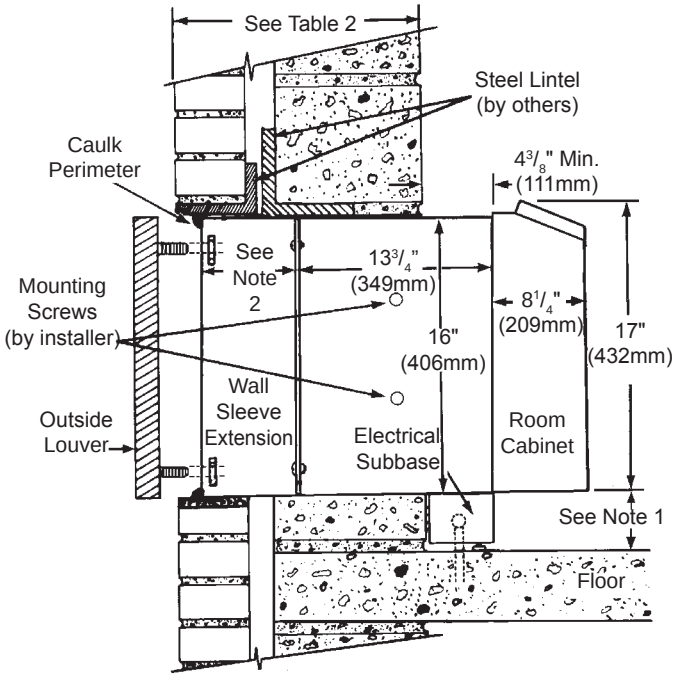
DO NOT drill holes in the bottom of the wall sleeve as it will cause leaks.

6. Where a subbase is used, secure wall sleeve to subbase with clips provided.
7. Caulk the wall sleeve to the wall opening on both the inside and outside perimeter. Be careful not to plug the weep holes. Caulking should be resilient, nonhardening type such as silicone.

Table 2. Maximum Wall Thickness

Louver Type	Maximum Wall Thickness		
	No Subbase	Standard Subbase	Hydronic Subbase
Stamped	14"(356mm)	$9^1/_2$"(241mm)	$13^1/_8$"(333mm)
Architectural	$14^7/_8$"(378mm)	$10^3/_8$"(264mm)	14"(356mm)

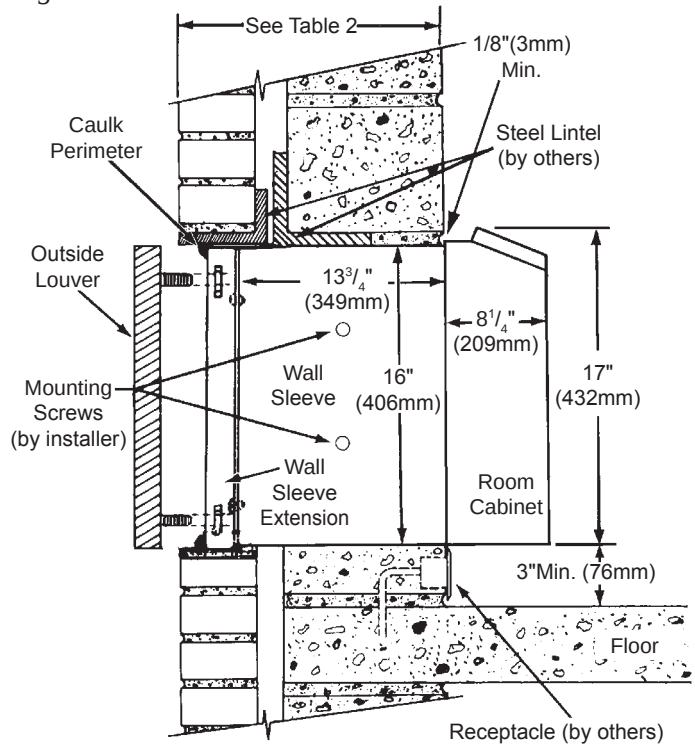
Figure 22. Thick wall construction with electrical subbase



Note: *1. Standard subbase is available in 3" or 4" (76 mm or 102 mm) height. Leveling legs provide adjustment of 1" (25 mm).*

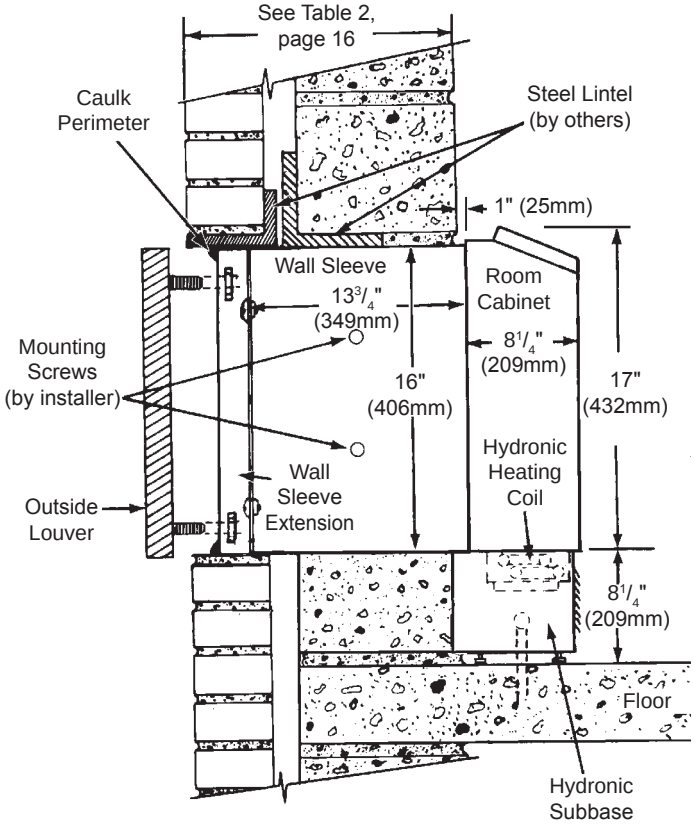
2. Wall sleeve extension is available in various depths and supplied as required.

Figure 23. Thick wall construction with cord connection



Installation of Basic Wall Sleeve

Figure 24. Thick wall installation with hydronic subbase



Attaching Wall Sleeve to Subbase

1. Where a subbase is used, secure wall sleeve to subbase with clips provided.
2. Caulk the wall sleeve to the wall opening on both the inside and outside perimeter. Be careful not to plug the weep holes. Caulking should be resilient, nonhardening type such as silicone.
3. Secure the two sections by installing the clip screws supplied with the hardware bag.
4. Caulk indoor/outdoor perimeter of wall sleeve with resilient caulk such as silicone.
5. Finish any uncompleted electrical and/or plumbing connections.

Outdoor Louvers

Two styles of exterior louvers are available. The flush stamped louver is a one-piece stamped aluminum type that is finished natural and clear anodized (Figure 25). Attractive, rugged architectural louvers (Figure 26) are extruded aluminum and are finished natural and clear anodized (optional colors are also available).

Figure 25. Flush Stamped Louver

Figure 26. Architectural Louver

Louvers by others are acceptable as long as they meet factory specifications. They must have a minimum free area of 70% or a pressure drop not exceeding .05 in. w.g. at 300 fpm face velocity and a blade design that will not cause recirculation of condenser air.

Note: *A Flush Stamped Louver cannot be used with a recessed louver wall sleeve. Recessed Louver is special order. Contact factory for more information if necessary.*

Free area is defined by ASHRAE as the minimum area of the openings in an air inlet or outlet through which air can pass. Have your local McQuay representative evaluate the application of special louvers or building facade treatments that may affect normal operation of the unit or restrict free air discharge of condenser airflow. A louver design that restricts the passage of condenser air or causes condenser air to be recirculated can dramatically alter the performance of the unit. Unit capacity and efficiency may be decreased and fan motor and compressor life can be shortened.

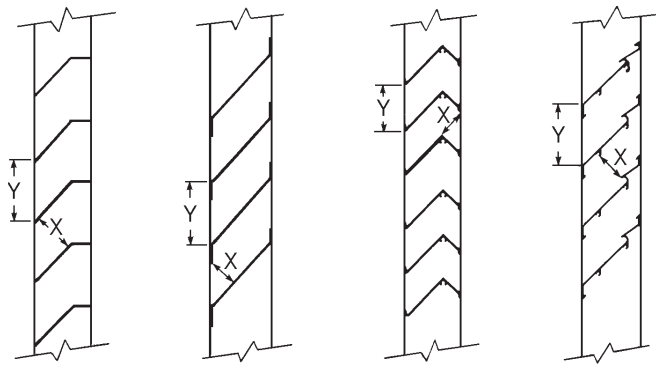
If the louver does not meet the requirements set out above or it is only marginally acceptable, then a drawing will be required for factory evaluation. If acceptance cannot be determined by the drawing, then a sample of the proposed louver must be sent to the factory for testing and certification. The sample sent for testing must be at least 16" high by 42" wide.

Typical Louver Design

Figure 27 illustrates some typical louver designs.

The "X" dimension represents the narrowest dimension through which air must pass. The "Y" dimension represents the increment of rise between the blades. To calculate the percentage of free area, divide dimension "X" by dimension "Y" (see Example).

Figure 27. Louver Designs



Example:
Free Area % = YX x 100

Where X = .7

Y = 1.0

Free Area % = 1.07 x 100 = 70%

IMPORTANT!

Air flow required for PTAC units must not be restricted by exterior plants or walls. Plants or shrubs must not be planted in close proximity to the outside grille of the PTAC unit. Vegetation planted too close to grilles will cause discharge air to be recirculated, thereby increasing electrical consumption. Warranty will be voided if it is determined that the compressor life is shortened from overheating due to close proximity of outside obstructions.

***Note:** Discharge air restrictions include, but are not limited to:*

- Vegetation
- Concrete walls or barriers
- Overhangs that do not allow discharge air to rise

Installation of Louver

1 Remove louver and mounting hardware from the shipping carton.
2 Remove temporary cardboard weather panel from wall sleeve.
3. Make a temporary handle by looping a piece of flexible wire or heavy cord through the louver. This enables the installer to keep a firm grasp on the louver when installing from inside the room.
4. Angle the louver through the opening at the rear of the wall box, then pull the louver back to the wall sleeve flange so that the louver studs pass through the holes in the flange.
5. Attach washers and nuts and secure louver in place.
6. If the heating/cooling chassis is not to be immediately installed, replace the weather panel.

Installation of Chassis

Proper installation of the heating/cooling chassis is extremely important to the proper operation of the unit. Whether the wall sleeve has been separately shipped or shipped with the chassis, proper installation is as follows:

⚠ WARNING

The chassis weighs approximately 150 lbs. Use blocking and lifting devices. Do not raise over any body parts.

1. Remove shipping carton and inspect for any shipping damage. Report any found to the carrier.
2. Save shipping carton to cover installed conditioner until construction is complete.
3. Check nameplate data on chassis to insure that the correct job site distribution has been made with respect to heating/cooling capacities. Generally, corner rooms require larger capacities.

⚠ WARNING

Improper electrical supply can cause property damage, severe personal injury or death.

4. Set front panel and air filter aside.
5. Remove chassis from carton by pulling evenly on substantial portion of unit.

⚠ CAUTION

Do not lift by pulling on the tubing. Tubing can crack or bend damaging the unit.

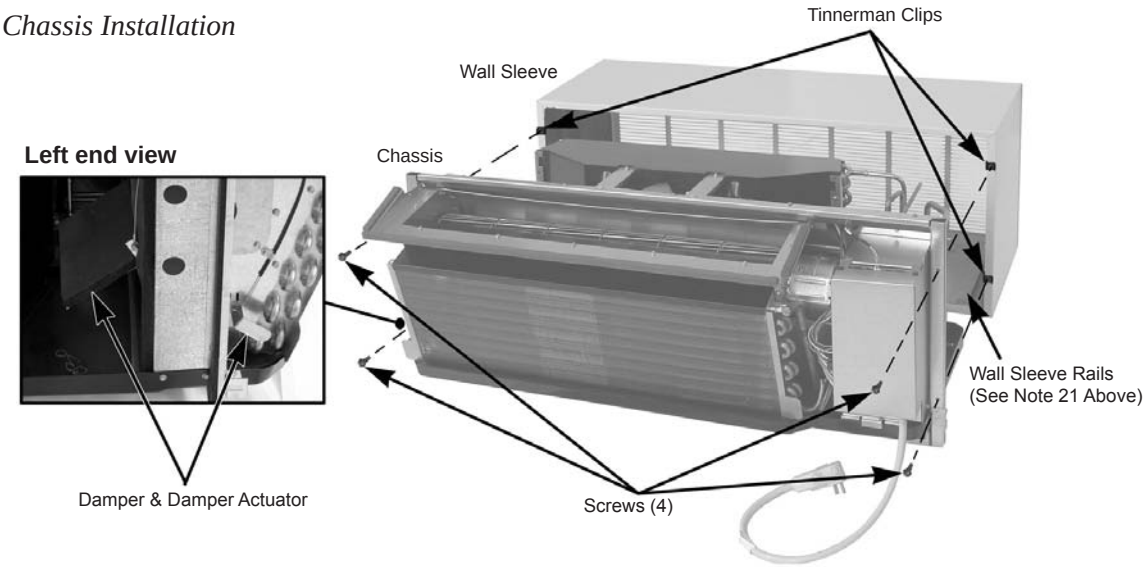
6. If wall sleeve has been previously installed, remove temporary cardboard weather panel.
7 If louver has been previously installed, remove temporary cardboard weather panel.
8 Place Tinnerman clips on wall sleeve. Clips and mounting screws enclosed in a bag attached to the inside chassis side panel (Figure 28).
9. Rotate fans to be sure they are free of obstruction.
10. Check all fasteners to make certain they did not loosen during shipment. Do not loosen nuts holding down compressor; they are factory installed.
11. Do not lubricate motors before start-up. Motors are permanently lubricated by the manufacturer.
12. Check all copper tubing and capillaries for proper clearance so they will not hit or rub during operation.
13. Slide chassis into wall sleeve until firmly seated against weather seals. Make sure tubing does not catch when inserting chassis.

⚠ CAUTION

Do not push on the coil surface, control box cover or fan scroll.

14. Secure the chassis in the wall sleeve with four (4) screws packaged with the Tinnerman clips (Figure 28).
15. Plug electrical cord into receptacle. Excess cord for 208V and 230V units should be coiled neatly and stored in the conditioner. Attach plug/cord cover to front face of subbase on 265V.
16. Set the manual damper operator in open or closed position as desired. On units equipped with the optional automatic fresh air damper, the damper is factory set to open whenever the fan motor is running and closed when it is off.
17. Set the indoor fan mode for off cycle on the PC board for the off cycle selection of 10, 20, 30 minutes or 1 hour off cycle time. The fan will operate for 2 minutes and shut down for the selected off cycle period. For continuous fan operation, the fan mode selection on the touchpad or remote thermostat must be set to continuous or on. When the room thermostat is in the cycle or auto mode, it will cycle the indoor fan when there is a call for heating or cooling. See page 33 & 34 for jumper placement details.
18. Set the temperature limiting feature to the desired range of thermostat operations. As shipped, the range is 60°F to 85°F.
19. Replace the air filter and front panel.
20. For hydronic units:
    a. Route the two low voltage valve wires, with Molex connection, through the opening provided in the subbase and connect to valve.
    b. Connect short power cord from the chassis to the receptacle in the subbase heat section.
    c. Relocate thermostat bulb to bracket located in the subbase. Refer to IM 936 which is provided with the hydronic subbase.
    d. Replace filter and louvered subbase front panel.
21. When installing the chassis in older wall sleeves, it may be necessary to bend the sheet metal flange at the rear of the wall sleeve rails to allow full insertion of the chassis.

Figure 28. Chassis Installation



Controls (Non-programmable)

Standard Digital Touchpad Control

Figure 29. Standard Digital Touchpad Control

Application

The PTAC Digital Control is used to control a PTAC Unit that includes both an integral air conditioner and a source of heat.

The Digital Control is operated with a Touchpad.

Inputs and Outputs

- Indoor coil sensor, (ICS)
- Outdoor coil sensor, (OCS)
- Indoor air sensor, (IAS)
- Outdoor air sensor, (OAS)
- Remote T'stat, T'STAT (RCWYBG)
- Power supply: (24VAC)
- Line voltage input, (L1, L2)
- Indoor fan standby voltage, (L1STB L2STB)
- Control selection: (LUI, T'STAT
- Model selection: (AC/E, HP, HP/E)
- Time delay bypass, (TEST)
- Indoor off fan cycle: (FAN, OFF CYCLE–10, 20, 30, 1 HR)

Outputs

- Compressor output, COM
- Indoor fan, BLOWER LO, HI
- Outdoor fan, OUTDOOR FAN
- Electric heater, ELE
- Reversing valve, REV VALVE

Figure 30. Standard Digital Control Indicators

User Interface

The user will by default control the Electronic Controller via the touchpad. The user can select with a jumper for the unit to receive commands from a Remote Thermostat.

Keys and Indicators Labels

7 Push Buttons	ON/OFF, FAN SPEED, MODE FAN MODE, SLEEP Temp buttons: ▲ for Temp UP and ▼ for Temp DOWN
9 LED Indicators	SLEEP, COOL, COOL/DRY, FAN, HEAT, HIGH, LOW, CYCLE, CONT.
LED 2 Digit Displays	No Label

Display Function Legend

Tr = Room Temperature
hI = High Room Temperature
Lo = Low Room Temperature
LA = Low Ambient Lockout
rT = Remote Thermostat Control
tP = Touchpad Control
t = Time
Ts = Temperature Setpoint
Rf = Room Freeze Condition
CF = Coil Freeze Protection
F = Fahrenheit
C = Celsius
LC = Control Lockout Mode

Remote Thermostat Control

The Remote Thermostat can be any thermostat that can interface with an electronic thermostat via RCWYBG terminals. The Control Selection jumper must be in T'STAT position. During a call the remote thermostat will pass R back to the controller on a respective terminal. The push buttons on the touchpad become inactive in the remote thermostat mode. However, the control pad LED display will indicate the mode of operation, and the room temperature.

Controls
Standard Digital Touchpad Control

Operation
Memory Recall
The digital control shall start with the last settings used prior to power down. These settings are saved in a non-volatile memory. Factory set mode is OFF.

On/Off Triggering
Control can be turned On/Off via LUI, Remote T'stat, or Sleep feature. The control will show the temperature set point when the mode is Cool, Cool Dry, or Heat. The display will be blank in Fan mode.

1. **On/Off triggering with LUI**
   Control shall turn On or Off when the On/Off button is pressed in LUI. Once turned on control shall start on the last mode used before it was turned Off.
2. **On/Off triggering with the Remote T'stat**
   Control shall be turned On if it was Off from the Remote T'stat when it is set up to be controlled by a Remote T'stat. A call for heat or cool from the Remote T'stat will be used to turn the control on. Control remains on until manually turned Off.
3. **On/Off triggering with the Sleep feature**
   Sleep feature works in combination with the Timer setting. Sleep time setting shall be user adjustable from 1 to 15 hours via the Touchpad. The timer will count down and when it reaches "0" it will turn the control Off if control was previously On and vice versa, if it was Off it will turn On after time expires. As mentioned in **protections** section of this spec the Sleep operation is overridden by room freeze protection.

Control Off
When the control is in the Off Mode, relay outputs will be disabled with the exception of the indoor fan (blower). It will stay on to meet the **Hot Keep** specification. Indicator LED's are all off.

Temperature Range
The maximum operating temperature range is selectable via the Touchpad and is 60°F to 85°F, with the limits included. The Remote Thermostat selectable operating range is 60°F to 90°F with limits included. The range is set in the Set-up menu.

Indoor and Outdoor Fan Operation
The indoor fan can be set to operate on High or Low speed with the Fan Speed Button on the touchpad. It can also be set for Continuous or Cycle operation on the touchpad. When set for Continuous, the "CONT" LED will be on and the fan will run continuously. When set for Cycle, the "CYCLE" LED will be on and the fan will turn on at a call for heat or cooling.

Fan Cycle Operation:
On a call for Heating or Cooling, the indoor fan and the heating source or the compressor will be activated. When the call is satisfied and the heating source or the compressor is deactivated, the indoor fan will repeatedly run for 2 minutes on and the number of minutes selected on the PC Board off, until the next cut-in cycle. The number of cycles with timing as described above is determined based on the OFF FAN CYCLE jumper setting.

Remote T'Stat Mode
The unit can be jumper configured to take commands from a Remote Thermostat. The Remote Thermostat will call for Heat and Cool through the electronic controller.

1. The Remote T'stat will control through the board the work of the compressor, indoor and outdoor fans, the reversing valve, and the heater
2. System will run in Cool mode when Y signal is high. In cool mode compressor (therefore outdoor fan) shall turn on
3. Cold start feature (see Modes of Operation – Cold Start), Cool dry mode (see Cold Dry Mode) and Sleep feature (see Sleep Feature) are not available in Remote T'stat cool mode

Controls

Standard Digital Touchpad Control

System Select Operation Using Remote Thermostat

System will run in Heat mode and engage certain outputs based on the system selection (jumper) as described below (see Standard Digital Control Board Wiring Diagram on page 34).

AC/ELE

- If AC/ELE is selected then a signal on W terminal will call for heating.

HP or HP/ELE

- If HP or HP/ELE is selected then signals on Y and B terminals will call for heating.

Notes:

1. *Hot start and Sleep features are not available in Remote T'stat heat mode.*
2. *Control's operation is subject to its own protection features when controlled by a remote thermostat.*
3. *Indoor fan mode and the speed will default to "cycle" and "high" when unit is controlled by remote thermostat.*
4. *The indoor fan is turned on when G signal is high. When there is no signal on G terminal then the indoor fan will be turned off.*

Control Lockout Feature

The control is placed in a lockout mode of operation when Mode button is held pressed for 10 seconds. Display will show "LC" to confirm Lockout Mode has been entered. Once in this Lockout Mode the control board will not take any commands at all. In Lockout, unit will continue to operate with the settings just prior to Lockout Mode. This means the touchpad will no longer be able to pass commands to the control. User's set point will normally be displayed. Any button pushed will bring "LC" on display for five seconds.

To exit the Lockout Mode and return to normal (regular) mode of operation, press the Mode button for 10 seconds. Display will show "nL" for five seconds to confirm normal mode has been resumed.

Modes of Operation

Cool Mode

In Cool Mode, the compressor will start if the temperature at the space temperature sensor is 1°F or higher than the set point. It will stop if the space temperature sensor is 2°F or lower than the set point, subject to timing requirements.

In the Cool Mode, the indoor fan will operate according to the user settings for Fan Mode – Continuous or Cycle and Speed.

Cold Start

Cold start is initiated when the control has not called for cooling for more than two (2) hours or during a power-on-reset. During cold start, the set point is lowered by 4°F (Tset-4°F) if the differential calls for cooling. The unit will operate in cold start until the new set point is satisfied (+ or – 1°F) or until the unit has run in cold start for at least 20 minutes. After one or both conditions are met, the set point will be reset to the user setting and the unit will run in the regular cool mode.

The indoor fan will operate according to the user settings for mode – Continuous or Cycle and Speed.

Cold start is not available with the **Sleep** feature.

Sleep Function

Sleep time is adjustable by the user from 1 to 15 hours in one (1) hour increments in a closed loop. The sleep time is adjusted and set via the touchpad and by pressing the Sleep Button repeatedly. On the touchpad, the display will show the set time in numbers for five (5) seconds. Before the sleep time expires, the setting can be adjusted above the number of hours passed by pressing the Sleep Button. Pressing the On/Off Button can terminate the Sleep Mode.

A changeover from Heat to Cool or another Mode will reset the Sleep Timer.

The Sleep Function will be deactivated by pressing the power-on-reset or any button (except sleep) on the touchpad or the Remote Control.

Cool Dry Mode

Select the Cool Dry Mode when the standard Cool Mode does not provide sufficient dehumidification. In Cool Dry Mode, the unit must run in Cool Mode for 12 minutes or until the temperature differential between the room temperature and the set point is less than 2°F. This will also occur after a Cold Start or a Mode change from Cool to Cool Dry. During this time, the fan will operate in the Mode and Speed selected.

Until one or both of the above conditions are met, the control will determine which Dry Mode (Zone) is initiated based on the temperature differential between the room temperature (Tr) and the temperature set point (Ts):

Note: *Cool Dry is not available with Sleep Function.*

Figure 31. if Tr - Ts > 4°F, operation will be in Zone A
Figure 32. if 2°F < Tr - Ts < 4°F, operation will be in Zone B
Figure 33. if 0°F < Ts - Ts < 2°F, operation will be in Zone C
Figure 34. if Ts - Tr > 5°F, operation will be in Zone D
The other temperature ranges are dead bands for zone stability.

Figure 31. Zone A

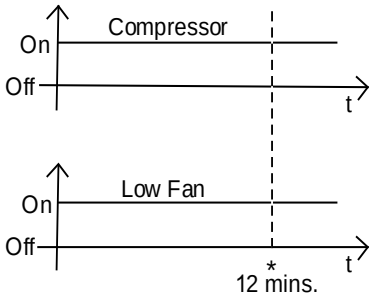


Figure 32. Zone B

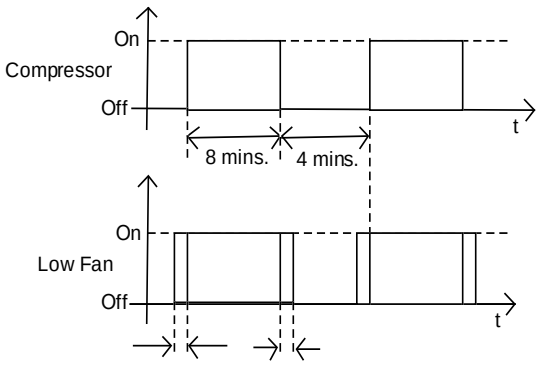


Figure 33. Zone C

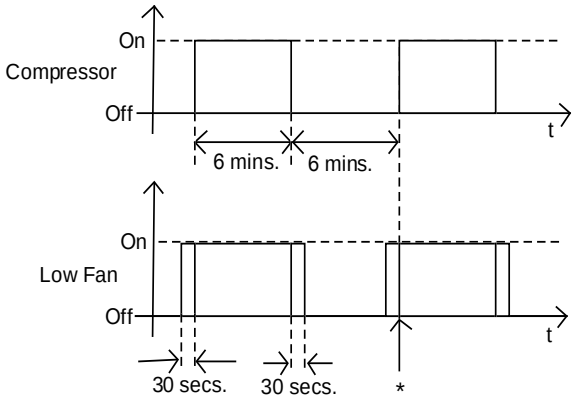
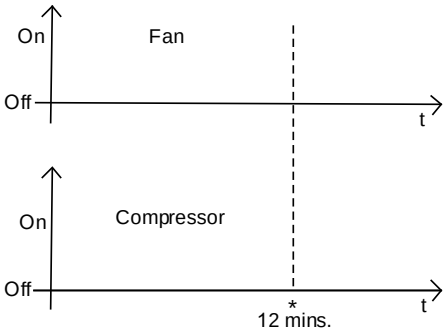


Figure 34. Zone D



Modes of Operation-Description
Standard Digital Touchpad Control

Heat Mode

Unit will call for heating based on the type of the heat source it has: heat pump in reverse cycle or electric.

1) Hot Start:

Hot Start is possible when the control has not called for heat in more than (2) hours or during power-on-reset. During Hot Start, the user's set point is raised 4°F (Ts + 4°F). The unit will only call for heat if room temperature differential calls for heat.

The unit will continue in Hot Start Mode until the new set point is satisfied (with a 1°F differential) or unit has run for at least 20 minutes. After one or both conditions are met, the set point will be reset to the user's setting and the unit will run in regular heat mode. Hot start is not available with the Sleep feature. The fan will operate per the Fan Mode and Speed setting.

2) Hot Keep:

When the water valve closes, the indoor fan will operate per the user mode (Constant or Cycle) and speed setting.

3) Sleep Function:

Sleep time is user adjustable from 1 to 15 hours in one hour increments, in a closed loop via the touch pad, by pressing the Sleep button repeatedly. The **Sleep Mode can be terminated by pressing the On/Off button.**

The Sleep Function will lower the temperature setting with time. Changing the Mode or a changeover from Heat to Cool will reset the Sleep Timer.

The Sleep function will be deactivated by Power-on-reset, or by pressing any button on the Touchpad except Sleep.

4) Fan Mode:

In the Fan Mode, the fan will operate continuously at the user's speed setting. The compressor and outdoor fan will not operate. In single motor units, the outdoor fan will run along with the indoor fan.

Set Up Mode

To enter the Set Up Mode, simultaneously press the Mode, Up and Down buttons for 5 seconds. To change settings, press the Up or Down button. To move from one screen to another, press the Mode button.

To exit Set Up, press the Mode Up and Down buttons simultaneously for 5 seconds or control will automatically exit Set Up in 15 seconds.

Settings within the Set Up Mode are as follows:

Control Selection:

To view the Control Selection Screen, press and hold the Up and Down buttons for 5 seconds. The setting may be changed by pressing either the Up or Down button. The "tP" setting is the default setting and indicates the touchpad control.

Temperature Limit Settings

To advance from Control Selection to Temperature Limit Settings, press the Mode button once. To set the Cool Minimum set point, press and hold Fan Cycle button and adjust the setting with the Up or Down buttons**. The minimum setting is 60°F.**

To set the Heat Maximum set point, press and hold Fan Speed button and adjust the setting with the Up or Down buttons. **Maximum setting is 85°F.**

The Display will show the upper operating limits first. The default settings are Cool min. = 60°F and Heat max. = 85°F.

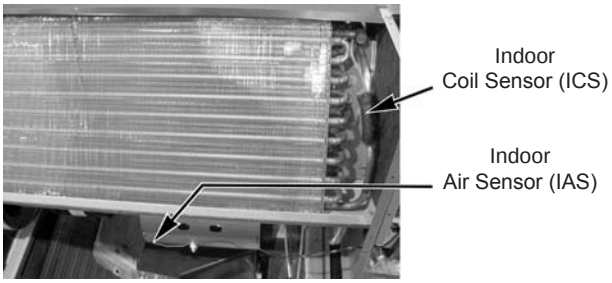
Hydronic Valve Operation

To advance from Temperature Limit Settings to Hydronic Valve operation, press the Mode button once. To toggle the setting, press either the Up or Down button. Settings are "no" (normally open) and "nc" (normally closed). Default setting is "no".

Indoor Air Sensor Reading

To advance from Hydronic Valve operation to Indoor Air Sensor Reading, press the Mode Button once. The control readout will show room temperature.

Figure 35. Indoor Air and Indoor Coil Sensor Locations



Modes of Operation

Standard Digital Touchpad Control

Outdoor Air Sensor Reading

To advance from Indoor Coil Sensor reading to Outdoor Air Sensor reading, press the Mode button once. The control readout will show the outdoor air sensor temperature.

Figure 36. Outdoor Air Sensor Location

Thermistor Failure Code and Condition

The system treats a sensor open or short as extremely cold or hot and reacts accordingly. The exception is the room air sensor, in which case the system will turn off. When the fault is corrected by replacement or repair, the respective error code will clear from the display (Table 1).

Table 3. – Failure Code and Condition

Thermistor Sensor	Condition	Error Code
Room	< - 58°F or > 140°F or Open or Close	E1
Indoor Coil	< - 22°F for > 2s or > 176°F for > 2s or Open or Close	E2
Outdoor Air	< - 22°F for > 2s or > 176°F for > 2s or Open or Close	E4

Compressor Random Restart

When power is interrupted, a random compressor restart delay of 0 to 2 minutes is initiated. In the Cool Mode only, the compressor will start operating only after the random delay plus 2 minutes (minimum off time for thermostat 2 to 4 minutes). Random delay is used only during system startup or reset.

Unit Protective Logic

Compressor Minimum Run Time

For thermostat-controlled running cycles, the compressor will have a minimum run time of 90 seconds. The compressor can be stopped at any time if the system is switched to any Mode, except the Cool Dry Mode.

Compressor Minimum Off Time (delay on break)

When compressor is under the thermostat control, it has a 2-minute delay before restarting when it has cycled off.

Anti-freeze Protection

In Anti-Freeze Mode, the compressor and outdoor fan will be stopped and the display will show “CF”. The compressor and outdoor fan can be started only if the following conditions are met:

1. after the 2 minute delay on break, AND
2. the indoor coil reaches 49°F or above and remains there for at least 1 minute, OR
3. another Mode is selected.

The system is in Anti-Freeze Mode when the following conditions are met:

1. The control is in either Cool or Cool/Dry Mode.
2. The indoor coil reaches 32°F and stays there for at least five (5) minutes.
3. The compressor has run for at least 90 seconds. Sleep Timer is overridden during this operation. Anti-freeze Protection is active in all modes of operation and when the control is Off.

Room Freeze Protection

When room temperature falls below 41°F, the hydronic valve is opened and the indoor fan operates on High Speed. The compressor and outdoor fan are off and the display will show “Rf”. The hydronic valve will close when the room temperature rises back to 50°F. During room freeze conditions, the temperature setting can be adjusted with the touchpad. Fan modes and Sleep Operation are overridden during Room Freeze Protection. Room Freeze Protection is active in all modes of operation and when control is off.

Temperature Limiting

When the room temperature drops 5°F below set point, the display will indicate “Lo.” When the room temperature rises 5°F above set point, the display will indicate “hI.” Alarm indications of 5°F above or below set point will be consistent with the set up mode settings for minimum and maximum temperatures.

Modes of Operation
Standard Digital Touchpad Control

Temperature Limit Settings

1 To adjust the lower operating temperature limit (cool minimum set point) press and hold Fan Mode button and adjust the setting with Up or Down buttons. The minute setting is 60ºF (15ºC).
2. To adjust the upper operating temperature limit (heat maximum set point) press and hold down Fan Speed button and adjust the setting with Up and Down buttons. The maximum setting is 85ºF (30ºC). When control selection is set for "T'STAT," the maximum setting can go up to 90ºF (32ºC).
3. The upper operating temperature limit will be displayed first.
4. Default settings are: Cool minimum 60ºF (15ºC) and Heat maximum 85ºF (30ºC).

Electrical Service

All wiring should be done in accordance with all local and National Electrical Code requirements. The conditioners are supplied as follows:

Electrical Heating Unit

1. 208V and 230V models are supplied with a power cord which will exit from beneath the conditioner on the control side. The cord has a usable length of 72" (457.2mm) from where it exits the conditioner. The use of an extension cord is not recommended. Time delay fuses are recommended to avoid nuisance tripping. The receptacle is generally mounted beneath the conditioner, on or recessed in the wall so that it is concealed by the conditioner over hang. The space under the conditioner must be at least 3" (76mm) high.
2. An electrical subbase is available for 208V and 230V units and contains a junction box for a field mounted receptacle All electrical connections are made within the subbase, thus eliminating the need for a wall mounted receptacle.
   The subbase is available in 3" (76mm) or 4" (102mm) height and can be furnished with factory mounted fused disconnect option.
3. On all 265V models, an electrical subbase is required. The chassis is supplied with a "short cord" which is just long enough to plug into the subbase. A plug cord cover is also furnished with the subbase to make the interconnecting cord inaccessible as required by the National Electrical Code. The conditioner is marked with the minimum circuit ampacity and maximum fuse size.

Equipment Start-up

Initial start-up of the Incremental® conditioners by experienced personnel is usually the responsibility of the installing contractor. This start-up consist of inspecting and operating the equipment for all functions at the time of initial installation and making necessary adjustments. It also includes demonstrating its proper operation to the owner or his agent.

Note: *that unless otherwise specifically agreed to in writing, McQuay International includes no field labor, start-up service or the like in the price of its equipment.*

After the equipment leaves the factory, it may become damaged or maladjusted during transportation or on the job. Sometimes wires are disconnected accidentally or fan motors move on their bases due to rough handling, causing fans to strike. The correction of such conditions is part of start-up.

⚠ CAUTION

Before starting equipment, make certain that:
1. Correct voltage has been supplied to the equipment.
2. The electrical plug from the control box has been inserted into the receptacle.

During Start-up (applies only to standard equipment):

Note: *Direction of conditioner air may be adjusted by repositioning the discharge grille to change airflow pattern in a room. The building superintendent or assistant manager should be requested to make any changes.*

PTAC/PTHP Startup Report – Audit

Job Name _____ City _____G.O. # _____

Installer _____Total No. of Units_____

Date of Final Inspection and Start-up _____

Manufacturers' Representative Name _____

Unit Type

☐ APTAC 16 × 42 ☐ Type K

☐ APTAC 16 × 44 ☐ Type J

☐ Enersaver

Name of Maintenance Manager Instructed _____ Other_____

Essential Items Check

A. Voltage Check _____ Volts (measured)

B. Yes	No	Condition	Yes	No	Condition
☐	☐	Filters Clean	☐	☐	Operates in Heating
☐	☐	Evaporator Coils/Drain Pans Clean	☐	☐	Operates in Cooling
☐	☐	Wall Boxes Sealed To Wall, No Leaks	☐	☐	Operates in Fan Only (if so equipped)
☐	☐	Wall Box Pitch Satisfactory	☐	☐	Hi-Lo Fan Speed Operational (if so equipped)
☐	☐	Air Discharge Free of Obstruction	☐	☐	Fans Rotate Freely Without Striking Fan Housing
☐	☐	Condenser Air Free of Obstruction	☐	☐	Cycle/Continuous Fan (if so equipped)
☐	☐	Other Conditions Found: _____			

_____

_____

Note: *"No"* answers above require notice to installer by memorandum (attached copy).

Please include any suggestions or comments: _____

_____

_____

_____

_____

Above System is in Proper Working Order

_____
Date

_____
Sales Representative Signature

_____
Customer Signature

FOR INTERNAL USE

Release:

SM _____

CTS _____

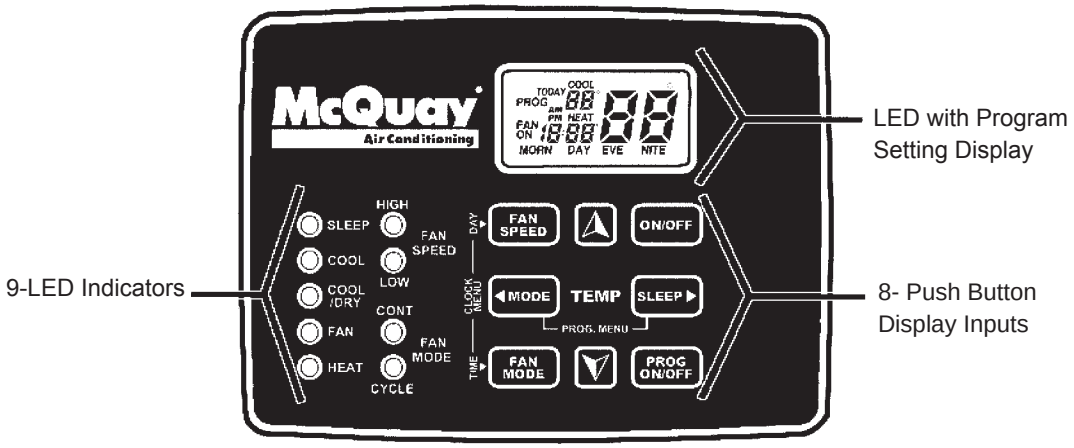
T_____

_____
Service Manager Approval

_____
Date

Controls

Premium (Programmable) Digital Touchpad Control Operating Instructions



Application

The PTAC Digital Control is used to control a PTAC Unit that includes both an integral air conditioner and a source of heat.

The Digital Control is operated with a Touchpad.

Inputs and Outputs

- Indoor coil sensor, (ICS)
- Outdoor coil sensor, (OCS)
- Indoor air sensor, (IAS)
- Outdoor air sensor, (OAS)
- Remote T'stat, T'STAT (RCWYBG)
- Power supply, (24VAC)
- Line voltage input, (L1, L2)
- Indoor fan standby voltage, (L1STB L2STB)
- Control selection, (LUI, T'STAT
- Model selection, (AC/E, HP, HP/E)
- Time delay bypass, (TEST)
- Indoor off fan cycle, (FAN, OFF CYCLE–10, 20, 30, 1 HR)

Outputs

- Compressor output, COM
- Indoor fan, BLOWER LO, HI
- Outdoor fan, OUTDOOR FAN
- Electric heater, ELE
- Reversing valve, REV VALVE

User Interface

The user will by default control the Electronic Controller via the touchpad. The user can select with a jumper for the unit to receive commands from a Remote Thermostat.

Keys and Indicators Labels

8 Push Buttons	ON/OFF, FAN SPEED, MODE, FAN MODE, SLEEP, PROG-ON/OFF Temp buttons: ▲ for Temp UP and ▼ for Temp DOWN
9 LED Indicators	SLEEP, COOL, COOL/DRY, FAN, HEAT, HIGH, LOW, CYCLE, CONT.
LED 2 Digit Displays	No Label

Display Function Legend

Tr = Room Temperature
hI = High Room Temperature
Lo = Low Room Temperature
LA = Low Ambient Lockout
rT = Remote Thermostat Control
tP = Touchpad Control
t = Time
Ts = Temperature Setpoint
Rf = Room Freeze Condition
CF = Coil Freeze Protection
F = Fahrenheit
C = Celsius
LC = Control Lockout Mode

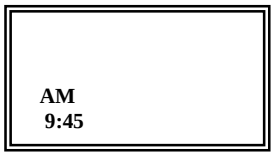
Remote Thermostat Control

The Remote Thermostat can be any thermostat that can interface with an electronic thermostat via RCWYBG terminals. The Control Selection jumper must be in T'STAT position. During a call the remote thermostat will pass R back to the controller on a respective terminal. The push buttons on the touchpad become inactive in the remote thermostat mode. However, the control pad LED display will indicate the mode of operation, and the room temperature.

Controls
Premium Digital Touchpad Control

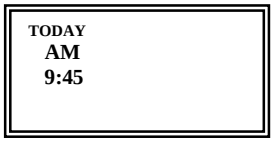
Clock Set Menu

1.1 To set the time and day of the week, press **FAN MODE** and **FAN SPEED** buttons simultaneously for 5 seconds. Time will be displayed first:



1.2 Adjust the time by pressing ▲ and ▼ buttons. By holding pressed ▲ or ▼ buttons, time will change in 15 minutes increments or decrements, respectively. AM and PM will show in rotation.

1.3 By pressing **FAN MODE** button, move to the confirmation day of the week. Numbers represent days of the week, Monday being 1 and so forth. **TODAY** will flash on display. Adjust the number that represents the day of the week by pressing ▲ and ▼ buttons:

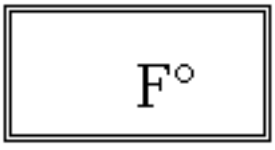


1.4 Exit the clock set menu by pressing **FAN MODE (TIME)** and **FAN SPEED (DAY)** simultaneously for 5 seconds

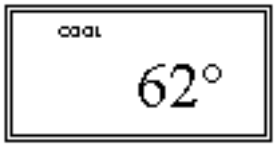
Configuration

The configuration mode is meant for temperature scale setting, limits for minimum and maximum operating temperatures and displaying sensor readings. To enter the configuration mode hold pressed ▲ and ▼ buttons for 5 seconds. Moving from one screen to another and rolling over is done by pressing Mode button.

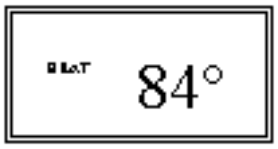
2.1 Once in the configuration mode, the default temperature scale will be displayed as shown below. Toggle the temperature scale to degree Celsius by pressing either ▲ or ▼ button:



2.2 To adjust the lower operating temperature limit (cool minimum set point) press ▲ and ▼ buttons. COOL and the setting will be displayed as shown below. The minimum and factory default setting is 60°F (15°C). An example of what can be displayed:



2.3 To view the upper operating temperature limit (heat maximum set point) press MODE button. HEAT will be displayed. An example of what can be displayed:



2.4 To adjust the upper operating temperature limit (heat maximum set point) press ▲ and ▼ buttons. The max and factory default setting is 85°F (30°C). When Control selection jumper on control board is set for "T'STAT," the max setting can go up to 90°F (32°C).

2.5 By pressing MODE button repeatedly from the previous screen, the following will be displayed in sequence:

- Indoor air sensor reading
- Indoor coil sensor reading
- Outdoor air sensor reading
- Outdoor coil sensor reading

2.6 Exit the configuration mode by pressing ▲ and ▼ buttons for 5 seconds

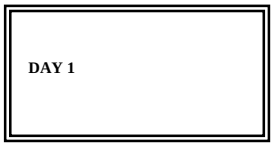
Controls

Premium Digital Touchpad Control

3.1 The touchpad of the electronic controller can be programmed for four time periods, **MORN, DAY, EVE**, and **NITE** that are customizable for each day of the week. Each period will have a start time, heat and cool temperatures. The unit will monitor the day and time, while maintaining the specific conditions for each period of the day. During programming, the item that is flashing is adjustable.

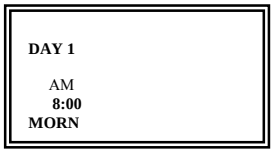
3.2 To enter the program menu, press **SLEEP** (▶) and **MODE** (◀) buttons for 5 seconds.

3.3 By pressing **SLEEP** (▶) display will show the day screen as shown below. Press ▲ or ▼ button to change the day to program. To advance to the next screen, press **SLEEP** (▶) button. To return to the previous screen, press **MODE** (◀) button.

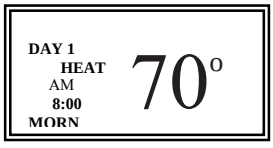


3.4 By pressing ▲ or ▼ button, the period of the day will change.

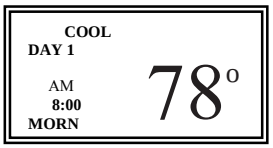
3.5 To advance to the next screen, press **SLEEP** (▶) button. Starting time will flash. Adjust the starting time by pressing ▲ or ▼ buttons.



3.6 To advance to the next screen, press **SLEEP** (▶) button. Heat temperature will be displayed. Adjust the heat setting with ▲ and ▼ buttons.



3.7 To advance to the next screen, press **SLEEP** (▶) button. Cool temperature will be displayed. Adjust the cool setting with ▲ and ▼ buttons.



3.8 To program the thermostat for each period of the day, repeat steps 3.3 through 3.7. Further, the thermostat can be programmed for each individual day of the week or use the *Simpleset*™ feature as described below.

3.9 *Simpleset* programming is a convenient method of programming the thermostat. Once the entire Monday (Day 1) schedule is set, *Simpleset* programming will copy the Monday schedule to every day of the week. After completing Monday schedule, "day 2" will appear on the screen. Press Down button once to get to "day 1." By pressing Down button for 3 seconds, days of the week will count down from 7 to 1 and settings are memorized. Once the schedule is locked in, go through each day of the week and make changes as needed. This feature speeds up the programming of the standard weekday/weekend schedule.

3.10 To exit the program mode, press **MODE** (◀) and **SLEEP** (▶) buttons simultaneously for 5 seconds.

3.11 After exiting the program mode, select the mode of operation and activate the program mode by pressing the **PROG ON/OFF** button.

NOTICE

After a power outage, programmed daily settings will be retained in memory. However, the clock must be reset to the current time for the programmed daily settings to resume the correct schedule of operation. See Clock Set Menu instructions to reset the time and day of week.

Controls

Remote Wall Mounted Thermostats

Wall mounted thermostats are available for the PDAA/PDHA unit in automatic or manual changeover styles. All include a fan switch for constant "on" operation or "automatic" for cycle operation with the compressor. When requested, all necessary relays and transformers are factory mounted and ready for attachment to field supplied low voltage wires. All thermostats are 24-volt type and have dual Fahrenheit and Celsius temperature setpoint scales.

Non-Programmable Heat/Cool Manual Changeover Thermostat (107095701)

Simple to operate, single push button for one-stage heating and cooling, or single stage heat pump. Zone compatible, and 4- or 5 wire compatible (terminal "C" is optional for non-heat pump systems). System "heat-off-cool" switch and fan "on-off" switch.

Figure 37. Non-Programmable Thermostat (107095701)

Specifications

Electrical Rating:
- 24 VAC (18 to 30 VAC)
- 1 amp maximum per terminal
- 3 amp maximum total load
- 60-minute power backup (SC2001)

Temperature Control Ranges:
- 45°F to 90°F, Accuracy: ±1°F

System Configurations:
- 1 stage heat, 1 stage cool or single stage electric heat pump

Terminations:
- R, C, W, Y, O, B, G

7-Day Programmable Manual Changeover Thermostat (107095801)

Simple, logical programming for set-up and set-back temperatures and times. Compatible with single-stage heat pump systems. Enables separate morning, day, evening, and night settings for every day of the week. Simpleset™ feature enables easy copying of one day's programming for the entire week. Select a warmer or cooler setting any time to temporarily override any program setting. Vacation hold overrides programming. Clear backlit display makes it easy to see time, temperature and setpoint – even in the dark. No batteries required.

Figure 38. 7-Day Programmable, Manual Changeover Thermostat (107095801)

Specifications

Electrical Rating:
- 24 VAC (18 to 30 VAC)
- 1 amp maximum per terminal
- 3 amp maximum total load
- 60-minute power backup (SC3001)
- Easy access terminal block

Temperature Control Ranges:
- 45°F to 90°F, Accuracy: ±1°F

System Configurations:
- Single stage heat, single stage cool or single stage electric heat pump

Terminations:
- RC, RH, C, W, Y, O, B, G

Controls

Remote Wall Mounted Thermostats

Figure 39. 7-Day Programmable Thermostat (107095901), and optional remote sensor (107096001)

Specifications

Electrical Rating:

- 24 VAC (18 to 30 VAC)
- 1 amp maximum per terminal
- 4 amp maximum total load
- 60-minute power backup for clock

Temperature Control Ranges:

- 45°F to 90°F, Accuracy: ±1°F

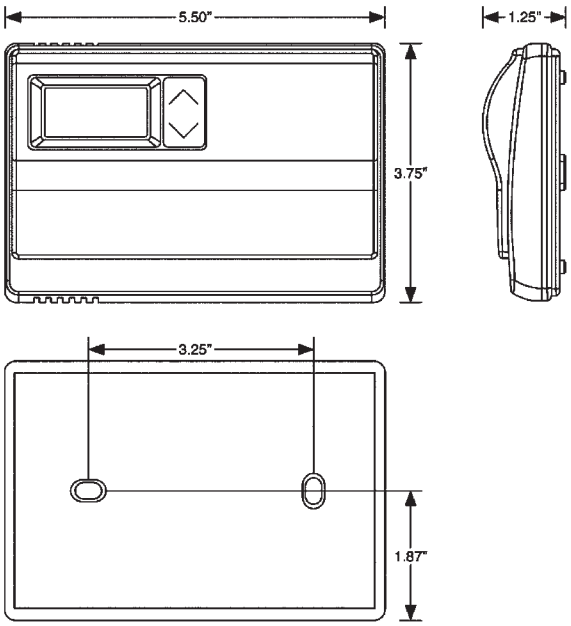
System Configurations:

- Single stage heat, single stage cool or single stage electric heat pump

Terminations:

- RC, RH, C, W, Y, O, B, G

Thermostat Dimensions – 107095701, 107095801, 107095901



Remote Wall Mounted Thermostats

Remote Thermostat Control

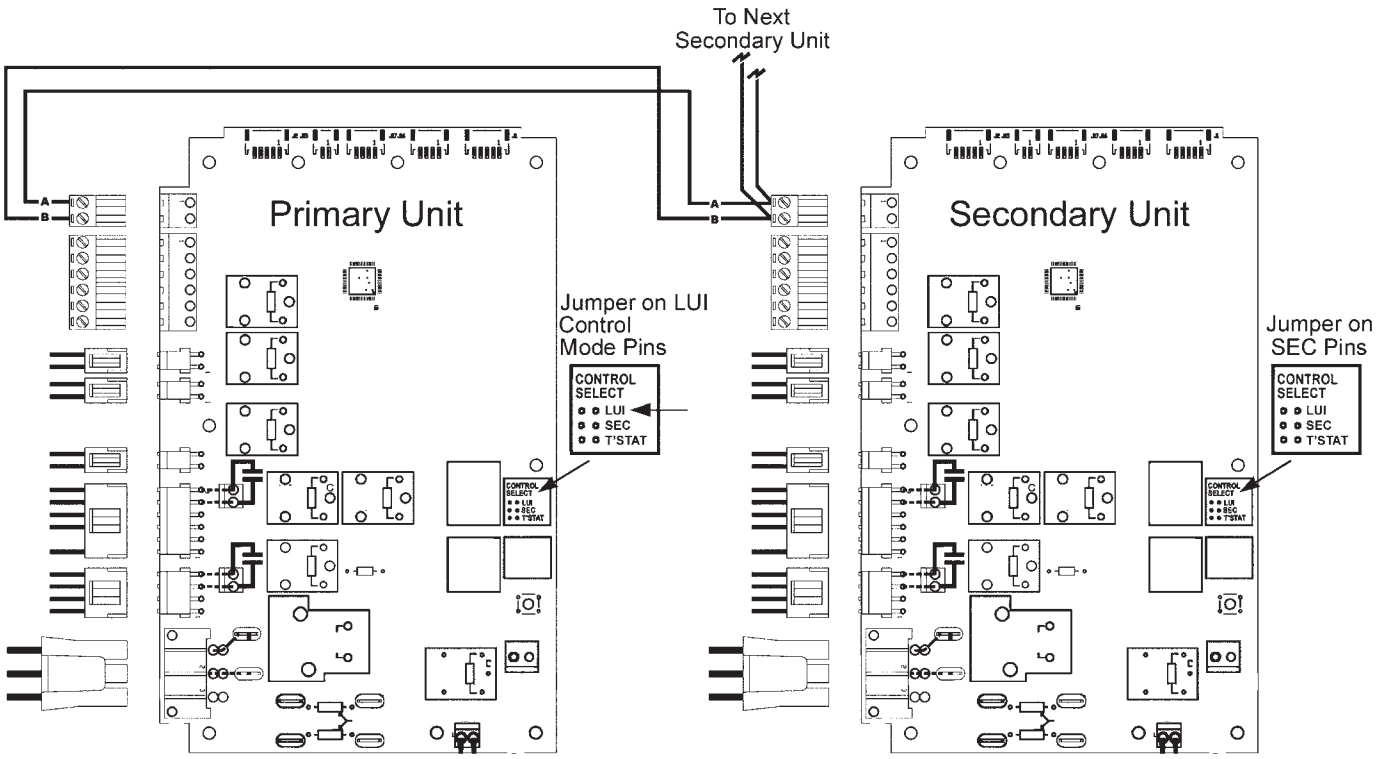
The Remote Thermostat can be any thermostat that can interface with an electronic thermostat via RCWYBG terminals. The Control Selection jumper must be in T'STAT position. During a call the remote thermostat will pass R back to the controller on a respective terminal. The push buttons on the touchpad become inactive in the remote thermostat mode. However, the control pad LED display will indicate the mode of operation, and the room temperature.

Installation of Remote Mounted Thermostat

Units that are furnished with remote mounted thermostats should be wired as shown in Figure 40. Other considerations for this arrangement are as follows:

1. When wiring the low voltage plug and receptacle disconnect, provide enough wire to move harness out of the way for chassis removal.
2. If subbase is used, a small hole must be drilled and grommeted in the subbase front to allow passage of the low voltage wires.
3. If secondary units are to be employed, see connections in Figure 40. The number of secondary units that can be connected is limited to 32 units.
4. When using a programmable wall thermostat, connect it to the terminal board remote thermostat plug. Refer to the instructions furnished with the chosen thermostat.

Figure 40. Remote Thermostat With Secondary Units Wiring Connections



Premium (Programmable) Digital Contol Wiring Diagram

1– Jumper Placement to Select System Module (See Jumper Detail)

A– Place jumper across AC/HYD to select Air Conditioner/Hydronic Heat.
B– Place jumper across AC/E to select Air Conditioner/Electric Heat.
C– Place jumper across AC/HYD/E to select Air Conditioner/Hydronic/Electric.
D– Place jumper across HP to select Heat Pump.
E– Place jumper across HP/E to select Heat Pump/Electric.

2– Jumper Placement to Select Fan Control:

A– When in Fan Cycle Mode, fan operates for 2 minutes – Place jumper across 10, 20, 30, or 1 HR to select fan cycle off minutes which will be overridden by the room temperature.

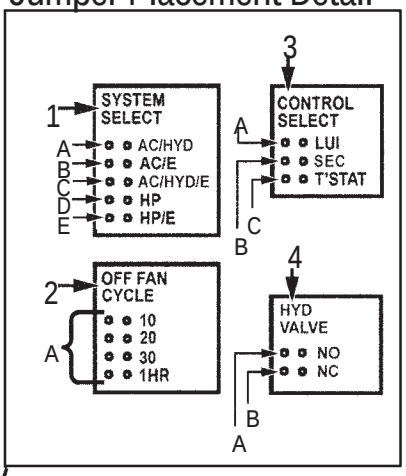
3– Jumper Placement to Select Controller Type:

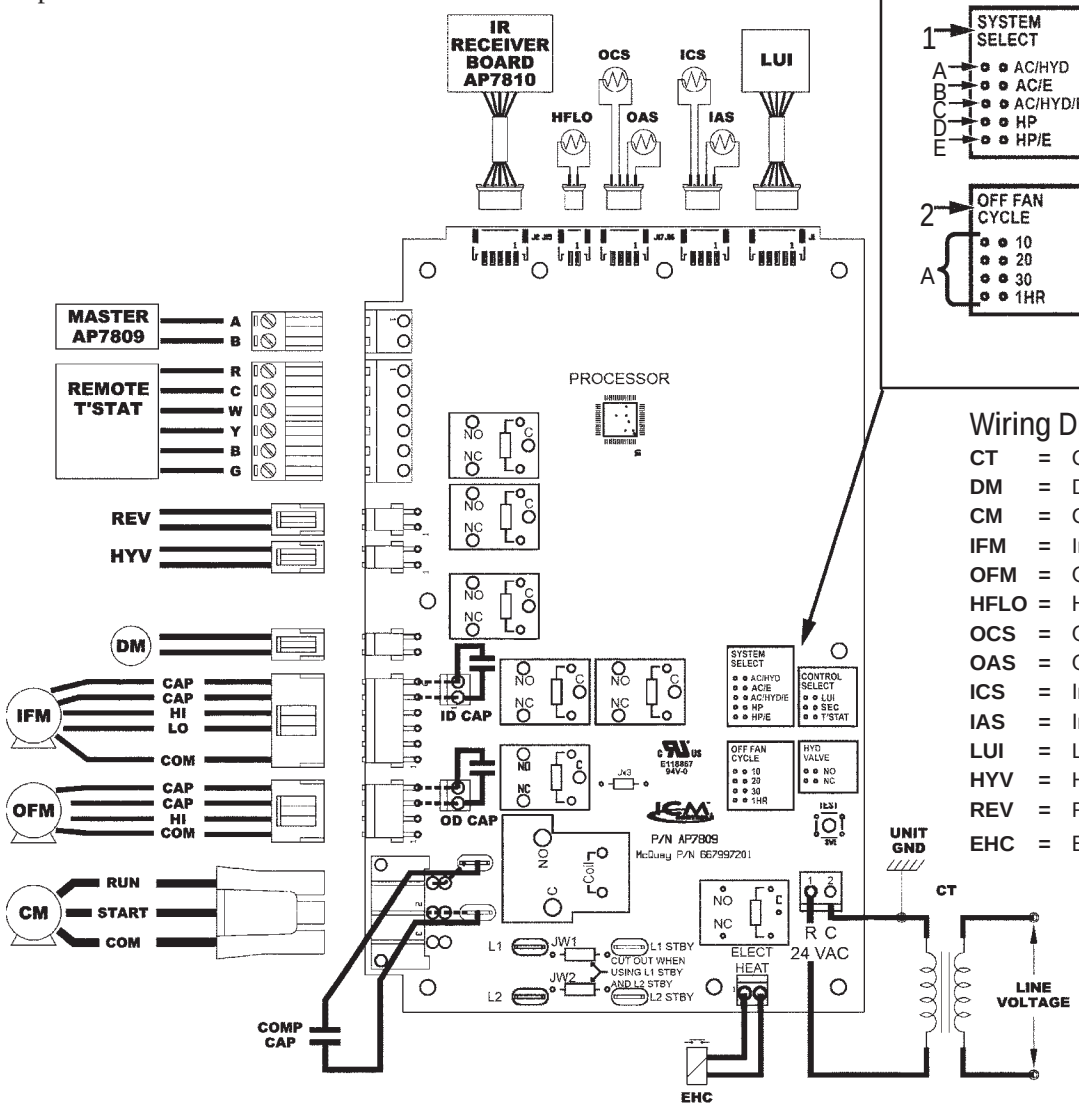
A– Place jumper across LUI to select unit mounted touchpad (Local User Interface).
B– Place jumper across secondary (SEC) to select secondary control by a primary unit.
C– Place jumper across T'STAT to select remote, wall mounted programmable, or non-programmable thermostat.

4– Jumper Placement to Select Hydronic Valve:

A– Place jumper across NO to select Normally Open Hydronic Valve.
B– Place jumper across NC to select Normally Closed Hydronic Valve.

Jumper Placement Detail





Wiring Diagram Legend

CT	=	Control Transformer
DM	=	Damper Motor
CM	=	Compressor Motor
IFM	=	Indoor Fan Motor
OFM	=	Outdoor Fan Motor
HFLO	=	Heat Fan Lockout Sensor
OCS	=	Outdoor Coil Sensor
OAS	=	Outdoor Air Sensor
ICS	=	Indoor Coil Sensor
IAS	=	Indoor Air Sensor
LUI	=	Local User Interface
HYV	=	Hydronic Valve
REV	=	Reversing Valve
EHC	=	Eletric Heat Contactor

Standard (Non-programmable) Digital Contol Wiring Diagram

1– Jumper Placement to Select System Module (See Jumper Detail)

A– Place jumper across AC/E to select Air Conditioner with Electric Heat.

B– Place jumper across HP to select Heat Pump.

C– Place jumper across HP/E to select Heat Pump with Electric Back-up Heat.

2– Jumper Placement to Select Fan Control

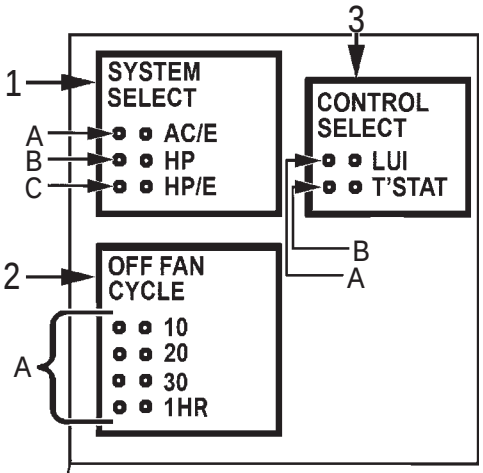
A– When in Fan Cycle Mode, fan operates for 2 minutes – Place jumper across 10, 20, 30, or 1 HR to select fan cycle off minutes which will be overridden by the room temperature.

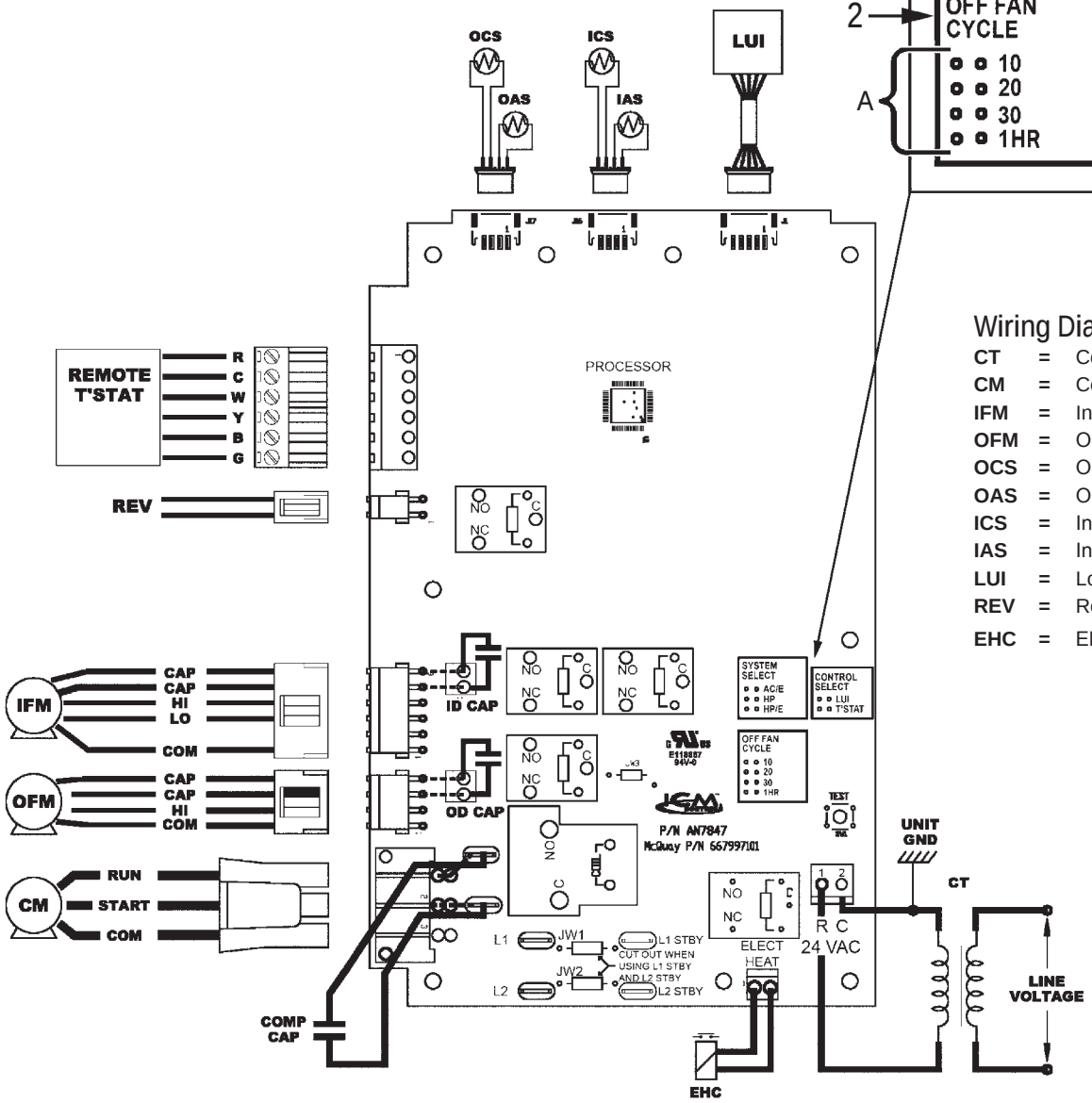
3– Jumper Placement to Select Controller Type:

A– Place jumper across LUI to select unit mounted touchpad (Local User Interface).

B– Place jumper across T'STAT to select remote, wall mounted programmable, or non-programmable thermostat.

Jumper Placement Detail





Wiring Diagram Legend

CT	=	Control Transformer
CM	=	Compressor Motor
IFM	=	Indoor Fan Motor
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OCS	=	Outdoor Coil Sensor
OAS	=	Outdoor Air Sensor
ICS	=	Indoor Coil Sensor
IAS	=	Indoor Air Sensor
LUI	=	Local User Interface
REV	=	Reversing Valve
EHC	=	Eletric Heat Contactor

Wiring Diagrams

Digital Control Board With Standby Power

The standby power connections, L1 STBY and L2 STBY are meant to run the indoor motor at a separate voltage from the other motors, compressor and outdoor motor. When used as such, the jumpers, JH1 and JH2, must be cut. This renders L1 & L2 and L1 STBY and L2 STBY isolated from each other.

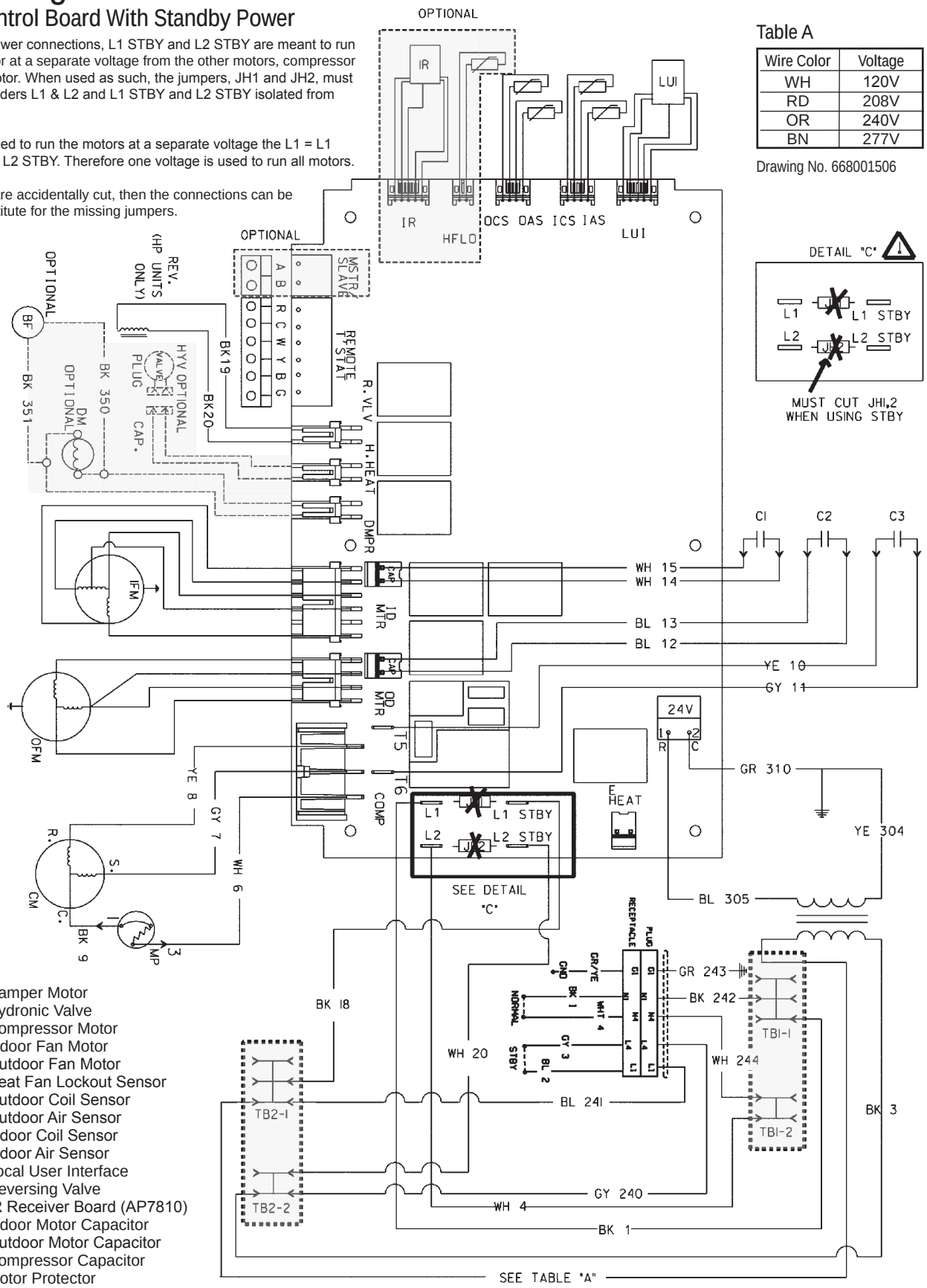
If there is no need to run the motors at a separate voltage the L1 = L1 STBY and L2 = L2 STBY. Therefore one voltage is used to run all motors.

If the jumpers are accidentally cut, then the connections can be spliced to substitute for the missing jumpers.

Table A

Wire Color	Voltage
WH	120V
RD	208V
OR	240V
BN	277V

Drawing No. 668001506



Legend

DM	=	Damper Motor
HYV	=	Hydronic Valve
CM	=	Compressor Motor
IFM	=	Indoor Fan Motor
OFM	=	Outdoor Fan Motor
HFLO	=	Heat Fan Lockout Sensor
OCS	=	Outdoor Coil Sensor
OAS	=	Outdoor Air Sensor
ICS	=	Indoor Coil Sensor
IAS	=	Indoor Air Sensor
LUI	=	Local User Interface
REV	=	Reversing Valve
IR	=	IR Receiver Board (AP7810)
C1	=	Indoor Motor Capacitor
C2	=	Outdoor Motor Capacitor
C3	=	Compressor Capacitor
MP	=	Motor Protector

Note: *The gray tinted areas in the wiring diagram; are options available only with the premium control board. For the latest drawing version refer to the wiring diagram located on the inside of the controls access panel of the unit.*

Digital Control Board Without Standby Power

The standby power connections, L1 STBY and L2 STBY are meant to run the indoor motor at a separate voltage from the other motors, compressor and outdoor motor. When used as such, the jumpers, JH1 and JH2, must be cut. This renders L1 & L2 and L1 STBY and L2 STBY isolated from each other.

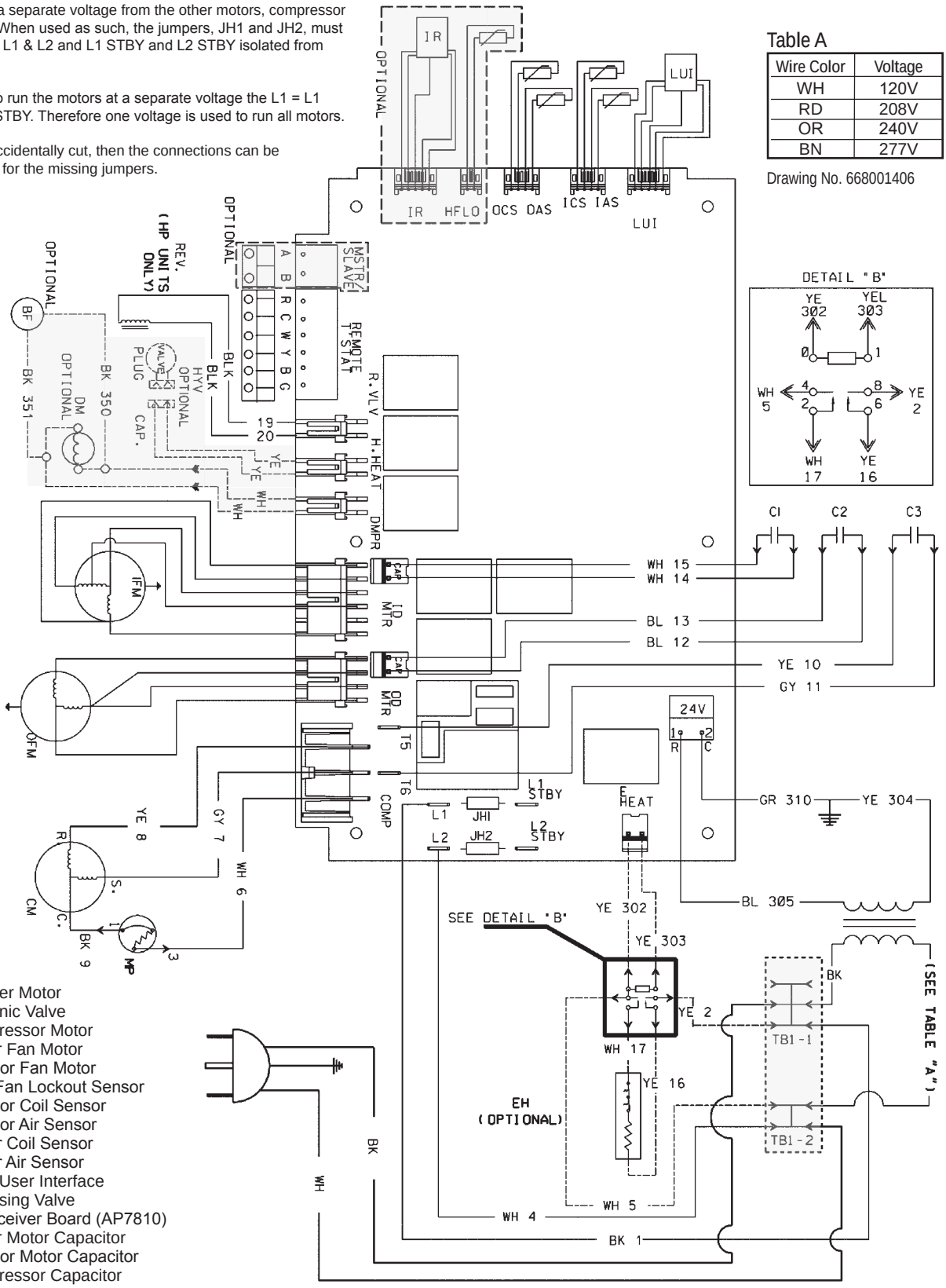
If there is no need to run the motors at a separate voltage the L1 = L1 STBY and L2 = L2 STBY. Therefore one voltage is used to run all motors.

If the jumpers are accidentally cut, then the connections can be spliced to substitute for the missing jumpers.

Table A

Wire Color	Voltage
WH	120V
RD	208V
OR	240V
BN	277V

Drawing No. 668001406



Legend

DM	=	Damper Motor
HYV	=	Hydronic Valve
CM	=	Compressor Motor
IFM	=	Indoor Fan Motor
OFM	=	Outdoor Fan Motor
HFLO	=	Heat Fan Lockout Sensor
OCS	=	Outdoor Coil Sensor
OAS	=	Outdoor Air Sensor
ICS	=	Indoor Coil Sensor
IAS	=	Indoor Air Sensor
LUI	=	Local User Interface
REV	=	Reversing Valve
IR	=	IR Receiver Board (AP7810)
C1	=	Indoor Motor Capacitor
C2	=	Outdoor Motor Capacitor
C3	=	Compressor Capacitor
MP	=	Motor Protector

Note: *The gray tinted areas in the wiring diagram; are options available only with the premium control board.*
For the latest drawing version refer to the wiring diagram located on the inside of the controls access panel of the unit.

Maintenance (Scheduled)

Incremental conditioners are built to last. With proper care, the unit should provide uninterrupted service for many years. Scheduled maintenance of this equipment as described below is the key to the equipment's longevity.

A. Air filters must be cleaned at regular intervals. Twice annually may be adequate in some areas while twice monthly may be required in others. Areas with high dirt and lint content or heavy usage of units require more frequent filter maintenance than those areas of relatively clean operating or low usage conditions. Unit malfunction will occur if air filters are not kept clean. Rinse filter with hot water and a mild detergent.

B. McQuay recommends that every year the chassis be removed for a thorough checkup. This should be completed as follows:

1. Unplug unit from power source.
2. Remove front panel.
3. Remove chassis from cabinet and move it to the maintenance department. Replace with spare chassis or weather plate.
4. Check all seals and insulation and repair as required.
5. Check all wiring and controls for hazardous conditions.
6. Thoroughly clean discharge grilles.
7. Cover motors and control module with water tight material and wash evaporator coil, condenser coil and base pan using hot water and a mild soap.

⚠ CAUTION

Residential and institutional cleaning compounds can cause permanent damage to the packaged terminal unit. To avoid damage to unit controls and heat transfer surfaces, do not spray cleaning compounds onto the discharge grille, return air opening, or unit controls. Normal cleaning can be accomplished by wiping the unit surface with a damp cloth. When using cleaning compounds on carpets, floors or walls, turn the unit off to avoid drawing potentially damaging vapors into the package terminal unit.

8. Check condensate removal system and assure proper operation. Pour at least two (2) cups of water into evaporator drain pan and verify proper operation. Clean condensate drain and clear weep holes located at the bottom rear of wall sleeve.
9. Dry equipment thoroughly, especially electric parts and installation.
10. Clean any rust spots with steel wool and paint with rust inhibiting paint.
11. Clean insulation or replace if necessary.
12. Check insulation on refrigeration piping and replace if necessary.
13. Check all fasteners and tighten as required.
14. Clean and oil damper door and linkage.
15. Test run chassis before reinstalling.

Equipment Protection From The Environment

The metal parts of this unit may be subject to rust or deterioration in adverse environmental conditions. This oxidation could shorten the equipment's useful life. Salt spray, fog or mist in seacoast areas, sulphur or chlorine from lawn watering systems, and various chemical contaminants from industries such as paper mills and petroleum refineries are especially corrosive.

If the unit is to be installed in an area where contaminants are likely to be a problem, special attention should be given to the equipment location and exposure.

1 Avoid having lawn sprinkler heads spray directly in or on the outdoor louver.

2 In coastal areas, the units must have the corrosion protection package to maintain the warranty coverage.

Regular maintenance will reduce the buildup of contaminants and help to protect the outdoor section of the unit.

1 Frequent washing of the outdoor section, condenser fan blade and condenser coil with fresh water will remove most of the salt or other contaminants that build up in the outdoor section of the unit

2 Regular cleaning of the cabinet with a good non-abrasive polish will provide protection and keep it in good condition.

3 A mild liquid cleaner may be used several times a year to remove matter that will not wash off with water.

The best protection is frequent cleaning, maintenance and minimal exposure to contaminant.

Maintenance

Recommended Spare Parts

An inherent advantage of the Incremental system is that failure of any part affects only one incremental conditioner and does not interrupt the operation of the rest of the system. A further advantage is that a failed part can be quickly and easily replaced, thus minimizing the inoperative time of the equipment. This is so, however, only if a replacement part is quickly available. In order to replace a failed part quickly and keep all incremental conditioners in good operating condition, McQuay International recommends that at the time incremental conditioners are purchased, owners arrange for a small stock of replacement parts.

Where an owner carries such a stock, immediate replacement of defective parts is possible. The defective part can then be returned to McQuay warranty parts. As long as it is still in warranty, it is repaired or replaced and returned to the owner with out cost for shop labor and material. Thus, the stock of replacement parts is constantly replenished. Below is a list of the kinds of parts which McQuay International recommends to be carried in stock together with the quantity of parts recommended per 100 incremental conditioners installed.

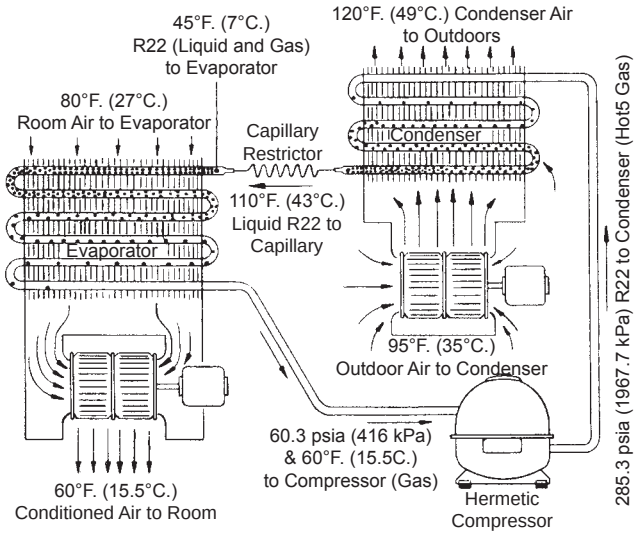
Cooling Chassis 2
Compressor Overload Device 2
Compressor Running Capacitor 2
Fan Motor. Capacitor 2
Control Board 2
Thermostat 2
Control Relay (if used) 2
Damper Motor (if auto damper) 2
Electric Resistance Heater (if electric heat) 2
Touch-up Paint (1 pt. spray can) 2

For the current spare parts list, and applicable prices, see your McQuay representative or write McQuay Service, P.O. Box 1551, Minneapolis, MN 55440.

Refrigeration Cycle

Every motor-driven refrigeration system operates on the carnot cycle. A practical understanding of what goes on at the various steps in this cycle can be a big help to the troubleshooting mechanic. Figure 41 illustrates the refrigeration cycle. The diagram shows what occurs in each component of a hermetically sealed system as used in all McQuay Air Conditioning equipment. The temperatures shown are typical of what they might be when the air entering the condenser (outdoor temperature) is 95°F, (350 C) and the temperature of the conditioned space is 80°F (270 C).

Figure 41. Refrigeration Cycle



Fault and Protection Codes for Applied PTAC/PTHP Control Board

Fault code	Description	Cause for the fault
CE	Communication Error	1. Cable not plugged in properly on either LUI or relay board. 2. Defective cable.
Sh	Missing Shunt	The user configurable shunt for System Select, Control Select Off Fan Cycle, and/or Hydronic Valve is missing or not placed properly.
E1	Problem with IAS	Indoor Air Sensor missing or short.
E2	Problem with ICS	Indoor Coil Sensor missing or short.
E3	Problem with OCS	Outdoor Coil Sensor missing or short.
E4	Problem with OAS	Outdoor Air Sensor missing or short.
E5	Problem with HFLO Sensor	HFLO Sensor missing or short on AP7809.
Protection code	Description	Cause for the fault
CF	Coil Freeze Protection	Indoor coil temperature has been below 32ºF for 5 minutes. Protection feature and the displayed code are dismissed when indoor coil temperature rises above 49ºF.
Rf	Room Freeze Protection	Indoor air temperature has dropped below 41ºF. Protection feature and the displayed code are dismissed when indoor room temperature rises at and above 50ºF.
hI	High Room Temperature	Indoor air temperature is 5 degrees above maximum setpoint limit. Protection feature and the displayed code are dismissed when indoor coil temperature rises above 50ºF.
Lo	Low Room Temperature	Indoor air temperature is 5 degrees below minimum setpoint limit.
LA	Low Ambient Lockout	Outdoor air temperature is below 35ºF.

Solid State Digital Controls – Local User Interface Display Codes

Fault code	Description	Cause for the fault
LC	Control Lockout –	Displays for 5 seconds when any button is pushed when in the "lockout mode".
nL	Control Lockout – Normal Control	Displays for 5 seconds to confirm normal mode of operation when control lockout turned off.
CL	Damper Closed	Control setup indicator damper is in "closed" mode.
AU	Auto Damper	Control setup indicator damper is in "automatic" mode.
AU	Auto HP/E	Control setup indicator heat pump electric is in automatic changeover mode (HP/E).
bY	HP/E Bypass	Control setup indicator, electric heat is bypassed when OCS > 40˚.
CF	Coil Freeze Protection	Indoor coil is ≤ 32˚ for at least 5 minutes. Compressor and outdoor fan stop and indoor fan continues to run for active defrost.
rF	Room Freeze Protection	Room temperature < 41˚. Damper closes (Premium board) and unit goes into heat mode.
Lo	Coil freeze protection	Room temperature is 5˚ below set point.
Hi	Temperature Limiting	Room temperature is 5˚ above set point.
LA	Low Ambient Lockout	Unit is in cooling mode and outdoor air < 35˚. Compressor will cut out.
E1	Indoor Air Sensor	Indoor Air Thermister Failure.
E2	Indoor Coil Sensor	Indoor Coil Thermister Failure.
E3	Outdoor Coil Sensor	Outdoor Coil Thermister Failure.
E4	Outdoor Air Sensor	Outdoor Air Thermister Failure.

Troubleshooting

These items should be checked by a qualified service technician only.

Trouble	Cause	Cure
1. Blowers won't operate on cool	a. No power	a. Check supply line fusses, circuit breakers, and be sure the power is on. Blown fuses would indicate circuit overloading, a short circuit, or a ground condition in the circuit Voltage supply to the equipment should be checked. Voltage underload must be within 10% of voltage given on date plate.
	b. Faulty push-button switch	b. Replace.
	c. Loose connections at push-button switch	c Tighten.
2. Blowers operate on cool but compressor does not start	a. Thermostat set too high.	a. Adjust Rotate control knob to "Cooler."
	b. Heat valve is open and heat is on.	b. Close heat valve.
	c. Low voltage.	c. Check as above.
	d. Faulty push-button switch.	d. Replace.
	e. Faulty connection at push-button switch.	e. Tighten.
	f. Defective wiring to thermostat.	f. Replace.
	g. Loose connections at compressor terminals.	g. Tighten.
	h. Wiring to compressor terminals defective.	h. Replace.
	i. Loose connections in compressor overload device.	i. Tighten.
	j. Starting capacitor malfunctions (open circuited, short circuited or loss of capacity).	j. Replace.
	k. Defective compressor motor (short circuited, open circuited, grounded).	k. * Ship cooling chassis prepaid to nearest McQuay authorized warranty station.
3. Blowers run on cool and compressor starts but stops after a short interval.	a. Operation of overload device due to overloading compressor motor.	a. Check voltage supply. Clean condenser inside and out. Check at outside face of condenser for recirculation of condenser air. Put air "splitters" in, if missing. Check compressor for short circuit. If defective, ship cooling chassis to nearest McOuay authorized warranty station.
4. Blowers run on cool and compressor starts and runs, but compressor occasionally stops (on overload device).	a. Low voltage due to overload circuits within building or throughout the local power system. Due to varying power demands, this condition might exist only at certain times during the day or on very hot days.	a. Run separate electric line to equipment Consult local power company.
	b. High voltage due to fluctuations in local power system; usually occurs during low load periods of the day	b. Consult local power company.
	c. Partial short circuit in compressor motor. Under normal loading a compressor with a partial short circuit might appear to be operating all right; increased condensing air temperature might then cause a short.	c. If confirmed, ship cooling chassis prepaid to nearest McOuay authorized warranty station.
5. Compressor starts and runs on cool but blowers do not run.	a. Faulty push button switch.	a. Replace.
	b. Open circuited blower motor.	b. Replace.
	c. Blower rubbing against its housing.	c. Adjust blower motor or blower wheel position.
	d. Bearings on blower motor seized.	d. Replace motor
	e. Loose connection at push-button switch.	e. Tighten.
6. Compressor starts and runs on cool, but fan motor starts, then stops.	a. Operation of the internally connected overload device due to a short circuit in blower motor.	a. Replace motor
	b. Windings, rubbing of blower wheel or lack of lubrication in blower motor bearings.	b. Adjust blower wheel or motor, or replace.
7. Equipment gives electrical shock.	a. Grounded electrical circuit.	a. Eliminate ground.
8. Insufficient cooling capacity.	a. Equipment standing too long without being run.	a. If the air conditioner is allowed to stand for an extended length of time without being run on cool, it is possible for all the refrigerant to become absorbed in the oil inside the compressor and refrigeration circuit. If this should happen there will be no cooling until the necessary working pressures have been established. This will take about 5 minutes of continuous running.
	b. Insufficient airflow through condenser due to: 1) Dirty condenser. 2) 0bstructed louver on outer cabinet or wall box. 3) Condenser blower/fan not running. 4) Condenser blower/fan not up to speed. 5) Condenser blower/fan slipping on motor shaft. 6) Recirculation of condenser air.	b. 1) Clean. 2) Remove obstructions. 3) Check same as in the case of malfunctioning condenser air blower. 4) Check for correct voltage. Replace blower motor if necessary 5) Adjust blower position and tighten setscrews. 6) Correct as in No 3 above.
	c. Insufficient airflow through evaporator due to: 1) Dirty evaporator. 2) Ice on evaporator coils. 3) Dirty air filter. 4) Obstructed discharge grilles. 5) Evaporator blower motor not running. 6) Evaporator blower motor not up to speed. 7) Evaporator motor slipping on motor shaft.	c. 1) Clean. 2) Turn equipment off to let ice melt (see last two items of No. 9 "Too much cooling," on page 15. 3) Clean or replace. 4) Remove obstructions. 5) Check as in No.1. 6) Check for correct voltage. Replace motor if necessary. 7) Adjust blower wheel position and tighten setscrew
	d. Heat load in room exceeds capacity of equipment.	d. Refer to original load calculations, recalculate heat load.
	e. Windows and doors in room are open	e. Close them.
	f. Compressor not pumping, indicated by: 1) Low wattage. 2) Condenser not warm, evaporator only partially cool or not at all .	f. * Ship prepaid to nearest McQuay warranty station.
	g. Restricted capillary or strainer. 1) Frost on capillary or strainer 2) Low wattage. 3) Condenser not warm. 4) Evaporator partially frosted, only partially cool or not at all.	g. * Ship prepaid to nearest McOuay warranty station.

Troubleshooting

These items should be checked by a qualified service technician only.

Trouble	Cause	Cure
9. Too much cooling.	a. Thermostat set too low. b. Defective thermostat	a. Adjust. b. Replace.
10. "Sweating."	a. Condensate drain from evaporator to condenser plugged. b. Insulating seals on equipment damaged. c. Evaporator blower motor not up to speed. d. Evaporator blower incorrectly positioned.	a. Remove obstructions to water flow. b. Adjust or replace. c. Check for correct voltage. Replace motor if necessary. d. Tighten.
11. Blowers won't operate on Heat.	a. No power. b. Heat is off (equipment with heat fan lock out). c. Faulty push-button switch. d. Loose connections at push-button switch. e. Thermostat set too low.	a. See No. 1. b. Open heat valve or turn on heating system. c. Replace. d. Tighten. e. Adjust. Rotate control knob to "warmer".
12. Equipment is noisy.	a. Blower rubbing against enclosure. b. Blower motor bearings dry. c. Loose blower hold-down nuts on motor-bracket assembly d. Refrigerant absorbed in compressor oil after extended shutdown. e. Equipment improperly installed. f. Damper solenoid hums. g. Loose terminal box cover on side of compressor. h. Loose electrical components. i. Copper tubing vibrating. j. Harmonics.	a. Adjust fan position on motor shaft or reposition fan motor bracket assembly. b. Replace motor. c. Align blower assembly and tighten nuts. d. Noise will disappear after equipment runs awhile. e. Make necessary adjustments to components. f. Check for proper adjustment. Apply silicone oil or grease to gap between solenoid and armature. g. Tighten. h. Fasten securely. i. Occasionally equipment will have noise for no apparent reason. Inspection has revealed no loose components that might be the source of the noise. Due to the action of the compressor, it is possible to have internal noise develop if the refrigerant tubing has become bent even slightly. To distinguish this condition from the simple rattle producing vibration caused by loose screws, nuts and other components, grasp the refrigerant tubing at various points throughout the system until a point is found where the noise is eliminated or reduced. Bend the copper tubing very gently until the noise disappears. j. Tighten.
13. Insufficient or no heat.	a. No steam or hot water being applied. b. No power. c. Faulty push-button switch. d. Loose connection at push-button switch. e. Thermostat set too high. f. Thermostat faulty. g. No power output on transformer secondary. h. Inoperative valve. 1) Steam valve N/C. 2) Hot water valve N/C.	a. Contact building management. b. Check power supply line fuse, circuit breakers. Blown fuses would indicate circuit overloading, a short circuit, or a grounded condition in the circuit. c. Replace. d. Replace wire or tighten. e. Adjust. Rotate knob to "warm." f. Replace. g. Replace. h. 1) Temporarily lock valve open; replace. 2) Replace.

Notes:

This guide was prepared with standard equipment in mind. If equipment is special, it may not be entirely applicable.

* *If equipment is still in warranty.*

** ***Note:*** *Before trying to correct the noise, determine its cause such as conditioned air blower, compressor or condenser blower. Operate the conditioned air blowers only. If this doesn't cause the noise, operate on cooling. Then disconnect one compressor lead. If the noise stops, the compressor is the source, If not, it is caused by the condenser blower.*

Unit Weight - (lbs.)

Model	007	009	012	015	017
PDHA (PACKAGED)	146.0	153.5	154.4	162.1	–
PDAA (PACKAGED)	144.5	152.0	152.9	160.6	165.6
PDHA (CHASSIS)	131.0	138.5	139.4	147.1	–
PDAA (Chassis)	129.5	137.0	137.9	145.6	150.6

Louvers

Flush-stamped.....6 lbs. (3kg)
Architectural .....8 lbs. (3kg)

Subbase

3" (76mm) High Electrical.....10 lbs. (5kg).
4" (102mm) High Electrical.....12 lbs. (5.4kg)
8" (203mm) High Hydronic.....20 lbs. (9kg)

McQuay Training and Development
Now that you have made an investment in modern, efficient McQuay equipment, its care should be a high priority. For training information on all McQuay HVAC products, please visit us at www.mcquay.com and click on training, or call 540-248-9646 and ask for the Training Department.

Warranty
All McQuay equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local McQuay Representative for warranty details. Refer to Form 933-43285Y. To find your local McQuay Representative, go to www.mcquay.com.

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